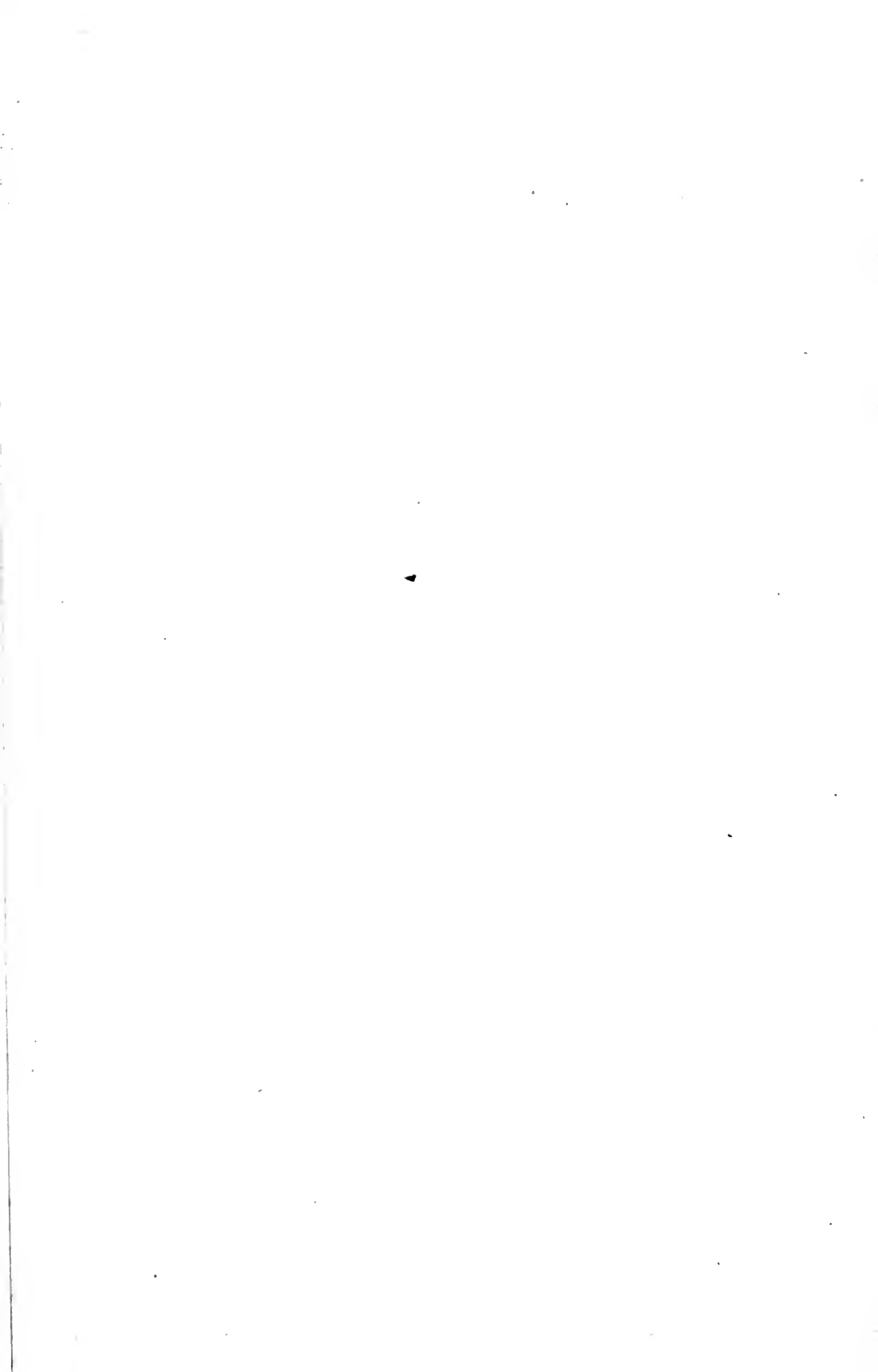


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AMERICAN CYCLOPÆDIA:

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OF

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THE NEW AMERICAN CYCLOPÆDIA.

HAYNE

HAYNE, ARTHUR P., an American officer and senator, grand nephew of the succeeding, and brother of Robert Y., born in Charleston, S. C., March 12, 1790. He was educated for a mercantile career, but in 1807, indignant at the attack on the frigate *Chesapeake*, he obtained a commission in the U. S. regiment of light dragoons commanded by Col. Wade Hampton. In 1812 he shared in the victory at Sackett's Harbor, and was promoted to the command of a squadron of cavalry, with the rank of major. In the campaign of 1813 he accompanied Gen. Wilkinson down the St. Lawrence for the contemplated attack on Montreal. Early in 1814 he received the appointment of inspector-general, was ordered to join Gen. Jackson in the Creek war, and in the temporary absence of Col. Butler served as adjutant-general. At the storming of Pensacola (Nov. 7, 1814) he was one of the first to take possession of the Spanish batteries. He was conspicuous in the brilliant night attack of Jackson on the British army, Dec. 23, 1814, which preceded the victory of New Orleans, in which he had a prominent part. Jackson wrote in his despatch: "Col. Hayne was everywhere where duty and danger called." He was brevetted 3 times during the war, and at its close was retained in the army as adjutant-general. During the 2d Florida campaign he was placed by Gen. Jackson at the head of the Tennessee volunteers. He retired from the army in 1820, previous to which he had prepared himself for the bar and had been admitted to practice. He was elected to the S. C. legislature in 1821, and was afterward appointed minister to the court of Belgium, but declined the office. In May, 1838, on the death of Mr. J. J. Evans, he was elected to the U. S. senate.

HAYNE, ISAAC, an American revolutionary officer, known as "the martyr," born in South Carolina, Sept. 23, 1745, died in Charleston, S. C., Aug. 4, 1781. He was the great-grandson of John Hayne, who emigrated to the state from near Shrewsbury, in Shropshire, England, about 1700. In 1765 he married and became a planter with large possessions in the districts of Beaufort and Colleton, and was a proprietor in extensive iron works in York district, subsequently destroyed by the British. In 1780

he was a senator in the state legislature. He took up arms on the invasion of the state by the British, and was employed in a cavalry regiment which kept the field during the final siege and capitulation of Charleston. The outposts of an army, according to the usual rule, sharing the fate of the main body, Hayne's detachment was supposed to be included in the articles of capitulation, and to partake of all the privileges and securities accorded by the victor to the vanquished. He was, in other words, paroled, under the sole condition that he should not again serve against the British while they held possession. When in 1781 the fortunes of the British began rapidly to decline, he and all others in his situation were required to repair to the British standard as subjects. The call was made upon him when his wife and several of his children lay at the point of death from small pox, but his expostulations were unheard, and he repaired to the city after obtaining a written pledge from the military commandant of his district that he should be allowed to return. This pledge was ignored in Charleston, and he was told that he must either become a British subject or be placed in rigorous confinement. With his family dying in his absence, he subscribed a declaration of allegiance to the royal government, but only under protest against the advantage taken of him at such a moment. He declared that he could never take up arms against his countrymen, and was assured that such duty would never be required at his hands. Thus enabled to return to his family, he maintained his pledge of neutrality so long as the British remained in possession of the district and forbore calling on him for military duty. But when, by the continued success of the Americans, they were driven from all quarters, and nothing remained to them but the stronghold of Charleston, they resolved to impose the requisition of military service on all those who had given their parole. Thus driven to the necessity of taking up the sword, Hayne did so in behalf of his countrymen; he repaired to the American camp, and was commissioned by the governor as colonel of a militia regiment. In July, 1781, he made an incursion to the Quarter House, a precinct

within 5 miles of Charleston, and captured Gen. Williamson, a Scotchman, who had gone over to the British from the Americans, and was an object of scorn and hate to the patriots. It was feared that he would be hanged as a traitor, and to avert this fate the British commandant at Charleston ordered out his entire force in pursuit. The scouts and sentinels of Hayne's command had wandered from their posts, and his party was consequently surprised and scattered, and he himself captured. He was brought to Charleston, and after a brief examination by a board of officers, without any trial, and no witnesses being examined, he was condemned to be hanged by the joint orders of Lord Rawdon and Lieut. Col. Balfour. He protested against this summary process, which was illegal, whether he was regarded as a British subject or as a captive who had broken his parole. The citizens and ladies of Charleston united in petitioning for his pardon. But Rawdon and Balfour were inexorable; a respite of 48 hours only was allowed him in which to see and take leave of his children, at the end of which period he was hanged. This vindictive measure was everywhere the occasion of horror and reproach. It was brought up and discussed with great ability in the British parliament, and while both Rawdon and Balfour justified it, each was solicitous to attribute it to the agency of the other. Public opinion ascribed it to revenge and mortification, to the remembrance of Major André, and to the frequent defeats and impending failure of the British commanders. Lord Rawdon (earl of Moira) published a justification of his conduct, which was analyzed and criticized by Robert Y. Hayne in the "Southern Review" for Feb. 1828.

HAYNE, JULIA DEAN, an American actress, born in Pleasant Valley, N. Y., July 22, 1830. She first appeared upon the stage in New York, at the Bowery theatre, in 1845, as Julia in the "Hunchback," and for a number of years, as Miss Julia Dean, was known throughout the United States as a popular and successful actress in such parts as Julia, Pauline in the "Lady of Lyons," Juliet, Marianna in the "Wife," &c. She has also appeared upon the English stage. Some years since she was married to Arthur Hayne of South Carolina.

HAYNE, ROBERT YOUNG, an American statesman, born in St. Paul's parish, Colleton district, S. C., Nov. 10, 1791, died in Ashville, N. C., Sept. 1840. He was educated in Charleston, studied law with the celebrated Langdon Cheves, and was admitted to practice before he was 21 years old. At the beginning of the war of 1812 he volunteered and served as a lieutenant in the 3d regiment of South Carolina troops raised for the protection of the seaboard. Toward the close of the war he resumed practice in Charleston, and succeeded in a great degree to the large professional business of Mr. Cheves on the election of that gentleman to congress. In 1814 Mr. Hayne was chosen a member of the state legislature, where he soon became distin-

guished for eloquence and ability. After serving two terms he was elected speaker of the house, unexpectedly to himself; and before his term expired he was elected attorney-general of the state. Soon afterward President Monroe offered him the attorney-generalship of the United States, which he declined. He retained his office till 1823, when he was chosen a senator of the United States. He was the youngest man that South Carolina had ever sent to the senate, and had barely attained the constitutional age for the office. He soon rose to a high rank as a debater and as a practical man of business, and was made chairman of the committee on naval affairs, in which post he displayed administrative abilities of a high order. Mr. Calhoun pronounced him the best chairman of a committee he had ever seen. In the debates upon the question of protection to American manufactures Mr. Hayne took a leading part, and in every stage of the discussion he was an able, vigilant, and uncompromising opponent of the protective system. When the tariff bill of 1824 came before the senate, he made in opposition to it an elaborate and powerful speech, in which, for the first time, the ground was taken that congress had not the constitutional right to impose duties on imports for the purpose of protecting domestic manufactures. He was equally strenuous in his opposition to the tariff of 1828, which roused in South Carolina the spirit of resistance that came to a crisis in 1832. In that year Mr. Clay proposed a resolution in the senate declaring the expediency of repealing forthwith the duties upon all imported articles which did not come into competition with domestic manufactures. Mr. Hayne denounced this proposition in a powerful speech, and submitted an amendment to Clay's resolution, to the effect that all the existing duties should be so reduced as simply to afford the revenues necessary to defray the actual expenses of the government. He supported this amendment in one of his ablest speeches, but it was rejected, and the principles of Mr. Clay's resolution were embodied in a bill which passed both houses and received the sanction of the president. The people of South Carolina, in convention, resolved that the law should not be law within their limits, and that the act of congress should be nullified so far as South Carolina was concerned. Mr. Hayne on this occasion was the first to declare and defend in congress the right of a state, under the federal compact, to arrest the operation of a law which she considered unconstitutional. This doctrine led to the celebrated debate between Mr. Webster and himself, in which the eloquence and the argumentative powers of both statesmen were displayed to their fullest extent. In consequence of the passing of the tariff bill the legislature of South Carolina called a state convention, which met at Columbia, Nov. 24, 1832, and adopted the celebrated ordinance of nullification. In the following December Mr. Hayne

was elected governor of the state, while Mr. Calhoun, resigning the vice-presidency of the United States, succeeded to his place in the senate. Gov. Hayne was soon called upon to face a great emergency. On Dec. 10 President Jackson issued his proclamation denouncing the nullification acts of South Carolina. The governor replied with a proclamation of defiance. South Carolina meanwhile prepared for armed resistance. Congress, however, receded from its position on the protective question, a compromise was made, the tariff was for the time satisfactorily modified, and South Carolina in another convention, of which Gov. Hayne was president, repealed her ordinance of nullification. In Dec. 1834, Mr. Hayne retired from the office of governor, and was soon after elected mayor of Charleston, with a view to the inauguration of a more enlarged policy in the municipal affairs of that city. He entered with characteristic ardor and energy into the project of connecting Charleston with the West by means of a railroad, was elected president of the company formed for that purpose, and was in attendance on a railroad convention at Ashville in mid-summer when he contracted a fever of which he died.—**PARR H.**, an American poet, nephew of the preceding, born in Charleston, S. C., Jan. 1, 1831. He was educated in Charleston, and has been a frequent contributor to the "Southern Literary Messenger" and other periodicals. He was formerly editor of the "Charleston Literary Gazette," was connected with the Charleston "Evening News," and has been from its beginning (1857) a principal editor of "Russell's Magazine," a monthly periodical published in Charleston. A volume of poetry from his pen was issued in Boston in 1854, and a 2d in New York in 1857. These collections consist chiefly of brief poems, sonnets, and lyrics, the "Temptation of Venus, a Monkish Legend," being the longest. A third volume, entitled "Avolio, and other Poems," was published in Dec. 1859, and he is said to have in preparation an elaborate poem on the subject of Sappho.

HAYNES, JOHN, governor of Massachusetts, and afterward of Connecticut, born in Essex, England, died in 1654. He came with Hooker and his company to Boston in 1633, was soon after chosen assistant, and in 1635 governor of Massachusetts. In 1636 he removed to Connecticut, being one of the prominent founders of that colony. In 1639 he was chosen its first governor, and every alternate year afterward, which was as often as the constitution permitted, till his death. He was one of the five who in 1638 drew out a written constitution for the colony, which was finished in 1639, the first ever formed in America, and which embodies the main points of all our subsequent state constitutions, and of the federal constitution. Bancroft describes him as a man "of large estate, and larger affections; of heavenly mind and spotless life; of rare sagacity, and accurate but unassuming judgment; by nature tolerant, and a friend to freedom; an able

legislator, and dear to the people by his benevolent virtues and his disinterested conduct." No man was more respected by the colonists of Connecticut, and few if any did more for the true interests of the colony.

HAYNES, LEMUEL, a colored minister, born in West Hartford, Conn., July 18, 1753, died in Granville, N. Y., Sept. 28, 1834. His father was a negro and his mother a white woman. The latter abandoned her offspring, who at the age of 5 years was bound out as a servant in a family at Granville, Mass., where he was treated with great kindness, and educated as one of the children. From his youth every leisure moment, and even some of the hours ordinarily given to sleep, were devoted to the acquisition of knowledge. In 1774 he enlisted as a minute man; in 1775 joined the revolutionary army at Roxbury; in 1776 was a volunteer in the expedition to Ticonderoga; after which he returned to Granville and engaged in agricultural pursuits. Between this time and 1780 he studied Latin and Greek, and became a highly respectable scholar in both, beside devoting much attention to theology. In 1780 he received license as a preacher of the gospel, and was at once unanimously invited to supply the pulpit of a new church in Granville. Here he remained for 5 years, his character and services being highly appreciated. In 1785 he was ordained, and, after preaching two years in Torrington, Conn., was called to a parish in Rutland, Vt., where he was settled in the pastoral office for 30 years. He afterward preached at Manchester, Vt., about 3 years; and then at Granville, N. Y., from 1822 till his death. He was a man of great shrewdness, wit, and common sense. One of his sermons, delivered on the spur of the moment, in reply to the well known Hosea Ballou, on the subject of Universalism, has gone through many editions on both sides of the Atlantic. A memoir of his life and character has been published by the Rev. Dr. Cooley.

HAYS, a central co. of Texas, drained by Pedernales and San Marcos rivers; area in 1857, 970 sq. m., since which time it has been reduced by the formation of Blanco co.; pop. in 1858, 1,997, of whom 762 were slaves. A chain of thickly wooded hills crosses it from N. E. to S. W., and the rest of the surface is generally undulating. The soil is well adapted to farming. The productions in 1850 were 19,000 bushels of Indian corn, 800 of oats, 380 of sweet potatoes, 7,350 lbs. of butter, and 1,091 of wool. There were 40 pupils attending public schools. Value of real estate in 1858, \$339,300. Capital, San Marcos.

HAYS, WILLIAM JACOB, an American painter, grandson of Jacob Hays, who was for many years high constable of New York, born in New York in 1830. He studied drawing with John Rubens Smith, a well known teacher, and in 1850 exhibited his first picture, "Dogs in a Field," at the national academy of design. His "Head of a Bull-Dog," painted in 1852, attracted considerable attention, and in the same year

he was elected an associate of the academy. He subsequently produced many pictures of dogs and game birds, some of which have been engraved. His last important work, painted for the collection of Mr. August Belmont of New York, in 1859, is entitled "Setters and Game." In 1859 he resigned his position as associate of the academy. With the exception of a few fruit pieces, he has painted almost exclusively animals, aiming at an imitation of their characteristics, and great elaboration in the execution.

HAYTI, or HARRI, formerly called Española or Hispaniola, and also Santo Domingo, one of the Greater Antilles, and after Cuba the largest, richest, and most beautiful of the West India islands, lying between lat. $17^{\circ} 36'$ and $19^{\circ} 59'$ N., and long. $68^{\circ} 20'$ and $74^{\circ} 28'$ W.; length E. and W. from Cape Engaño to Cape Tiburon, 406 m.; maximum width N. and S. from Cape Benta to Cape Isabella, 163 m.; area, including the islands of Tortuga, Gonaive, &c., 27,690 sq. m. The island is separated from Cuba and Jamaica on the W. by the Windward passage, the distance from Cape San Nicolas to Cape Maisi, Cuba, being 54 m., and from Cape Tiburon to Morant point, Jamaica, 116 m. In this passage, about 40 m. W. of Cape Tiburon, is the guano island of Navasa, claimed by Hayti, but now (1859) occupied by adventurers from the United States under the provisions of the act of congress of Aug. 18, 1856. The island of Tortuga lies a short distance from the N. W. coast, and that of Gonaive in the great bay enclosed by the vast peninsular projections which stretch W., the one toward Cuba and the other toward Jamaica, 85 m. apart. On the E., Hayti is divided from the island of Porto Rico by the Mona passage, 76 m. wide. At the present time the island is occupied by two independent states, the republic of Hayti in the W. and the Dominican republic in the E., corresponding in territory to the ancient French and Spanish possessions. The island is of very irregular form, being deeply indented by bays and inlets, and having corresponding projections of land; and hence its coast line, estimated at 1,200 m. in length, is relatively very extensive and affords numerous excellent harbors. Of the great peninsulas, that of the S. W. is the most conspicuous, being 150 m. long by 18 to 40 m. wide; that of the N. W. is about 50 m. long by 30 to 45 m. wide; and that of Samana on the N. E. about 40 m. long by 6 to 8 m. wide. The island is intersected W. and E. by 3 chains of mountains, connected by transverse chains or offsets, and intervening are extensive plains and savannas. The principal central chain, which culminates in Mt. Cibao, 7,200 feet high, commences on the W. at Cape San Nicolas, traverses the island in an E. S. E. direction, and terminates at Cape Engaño. Nearly parallel with this chain, another, commencing on the W. near Monte Christo, closely skirts the N. coast, and terminates abruptly on approaching the peninsula of Samana, subsiding into a low isthmus interlaced by estuaries and channels which sepa-

rate Samana from the main, and afford communication from the enclosed bay to the sea on the N. shore of the island; reappearing on the opposite side of this marshy tract, the heights are continued to Cape Samana, the E. extremity of the peninsula. Between these two ranges extends the Vega Real, or Royal valley, 130 m. long, watered by the Yaqui and Yuma rivers, and presenting almost boundless pasture lands. The third or S. mountain range commences on the W. at Cape Tiburon, extends E. through the S. W. peninsula, and terminates at the Rio Neyva, about midway between the cities of Port au Prince and St. Domingo. Beside the Vega Real, there are other extensive plains and valleys, as the *Ulanos* or flats of the S. E. 80 m. long, also a rich pasture district, and the plain of Cayes at the W. end of the island. The latter has been greatly extended by the formation of a kind of rock consisting of comminuted shells and coral, incrusting with calcareous cement, resembling travertine; and this kind of rock is now in process of formation throughout the whole of the West India islands; fragments of pottery and of other human works have been found in it at a depth of 20 feet. The proximity of the mountains to the N. coast prevents the formation of any considerable rivers, and hence the principal streams have their courses either in a W., S., or E. direction. The Artibonite flows W., and the Monte Christo or N. Yaqui N. W.; the Yuma flows S. E.; and the Neyva or S. Yaqui, the Nisa, and the Ozoma flow S. to the sea. They are all obstructed by sand bars, and few of them are navigable even for short distances. The Ozoma, however, admits vessels drawing 12 to $12\frac{1}{2}$ feet. Lakes are numerous; those of Enriquillo and Azua are salt; the former, in the valley of the Neyva, is 20 m. long by 8 m. broad, and the latter half that size. S. of these lies the fresh water lake of Icotea or Limon, about the size of Azua. Mineral springs exist in various parts; in the E. are the hot springs of Banica (temperature 112° to 125° F.), Biahama, Jayua, and Pargatal, and in the W. the chalybeate spring of Sainte Rose, the saline of Jean Rabel, and the sulphur of Dalmarie. The minerals found in the island are various, including gold, silver, platinum, mercury, copper, iron, tin, sulphur, manganese, antimony, rock salt, bitumen, jasper, marble, and several kinds of precious stones. The gold mines have been abandoned, and gold washing is only carried on by the poorer classes in the N. streams. Indeed, all the minerals are neglected for want of machinery and capital. The climate is hot and moist, but generally salubrious; in the N., and especially in the more elevated localities, there is a perpetual spring. The seasons are divided into wet and dry; in some localities years have passed over without a single heavy shower. The rainy season occurs on the opposite shores of the island at different periods of the year; and it is only on the S. coasts that hurricanes are common. At St. Domingo the extremes of temperature are 60°

and 95° , with an annual mean of 78.5° ; and at Port au Prince the extremes are 63° at 104° , with a mean of 81° . The maximum occurs in August and September, but the summer heats are much tempered by the sea breezes which refresh the evenings. Hayti has on several occasions suffered from earthquakes; the most disastrous on record are those of 1564, 1684, 1691, 1751, 1770, 1842, &c. By that of 1751 Port au Prince was destroyed, and the coast for 60 m. submerged; and by that of 1842 many towns were overturned and thousands of lives lost. Vegetation is chiefly of a tropical character, and wholly such except where elevation has a controlling influence. The mountains are clothed with majestic forests of pine, mahogany, fustic, satin wood, and lignum vitæ; also the roble or oak, the wax palm, divi-divi, and numerous other cabinet woods. The richest of flowering plants abound; and the usual tropical esculents, grains, and fruits, including plantains, bananas, yams, batatas, maize, millet, oranges, pineapples, cherimoyas, sapodillas, with melons, grapes, &c., are grown everywhere. The staples of cultivation are coffee, cacao, sugar, indigo, cotton, and tobacco, but of these the production for export has greatly decreased since colonial times, owing more however to the diversion than to the cessation of labor under the new system, and the export of natural products has in a measure taken the place of cultivated staples. The W. or French section has always been the best cultivated and most valuable part of the island, as it is the most populous. The native quadrupeds are small, the largest not bigger than a rabbit; but the animals introduced from Europe, and now in a wild state, have thriven prodigiously, large numbers of cattle and hogs now roaming freely in the savannas and in the mountain forests. Birds are not numerous; still large numbers of pigeons are annually taken and used as food, and ducks and other water fowl frequent the marshy places. Insects, many of them venomous or annoying, abound. The lakes and rivers contain caymans and alligators; in the surrounding seas whales are frequently taken; and turtles, lobsters, and crabs abound on the coasts.—HAYTI, the celebrated negro republic, occupies the W. portion of the island, and is divided from the Dominican republic on the E. by an irregular line drawn from the mouth of the river Anses-à-Pitre or Pedernales on the S. coast to that of the river Massacre, which flows into the bay of Manzanilla, on the N. coast. Its territory, corresponding to that of the ancient French colony, extends between lat. $17^{\circ} 55'$ and $19^{\circ} 55'$ N. and long. $71^{\circ} 52'$ and $74^{\circ} 38'$ W., and, including the islands of Tortuga, Gonaive, &c., contains 10,091 sq. m., divided into 6 departments, subdivided into arrondissements and communes; the population is variously estimated at 550,000 to 572,000. The chief towns are Port au Prince, Cape Haytien, Gonaives, Cayes, Jacmel, and Jeremie. Port au Prince, or Port Republicain, is the cap-

ital and principal seaport; it is situated at the head of the bay of Gonaive, and has about 25,000 inhabitants. Gonaives, 65 m. N. W., is situated at the N. E. extremity of the same bay. Cape Haytien, or Cape Français, is the principal port on the N. coast. Jacmel and Cayes are the chief ports on the S., and Jeremie on the N. shore of the S. W. peninsula; and on the same peninsula are found Baint, St. Louis, and Tiburon, the last at the extreme S. W. of the island, and, facing on the bay of Gonaive, the ports of Goave and Bon. San Nicolas is situated at the extremity of a deep bay formed by the cape of the same name and the mainland of the N. W. peninsula. The country, as observed in the preceding description, is mountainous, interspersed with rich fertile plains and valleys, is well watered, and yields spontaneously numerous valuable products, as timber, cabinet woods, and dye stuffs. Agriculture, however, on which it must greatly depend for prosperity, is in a very primitive condition, and is prosecuted without vigor. In colonial times, when the soil was cultivated by forced labor, this same country produced for export 5 or 6 times the amounts now exported. From this diminution of exports, however, it must not be inferred that industry has ceased. The labor once expended on plantations has in a great measure been transferred to the forests, as is evident from the substitution of natural for cultivated staples in the list of exports; and it is also certain that most of the articles of consumption, once enumerated among the imports, are now produced from the soil, though they do not appear among the commercial exchanges. The annual value of exports is stated at \$5,000,000 or \$6,000,000, and the total commerce at \$9,000,000 or \$10,000,000. The exports for the year 1789 were valued at \$27,828,000, consisting principally of sugar, coffee, and cotton. Sugar is no longer exported, and the quantity of coffee exported scarcely exceeds a third, and of cotton a tenth of the export of the year named. Logwood, mahogany, and other woods, on the contrary, are more largely exported, and also cacao, the cultivation of which is on the increase. The imports at the present day consist principally of manufactured goods, no manufactures being carried on by the inhabitants. The principal commercial transactions are with the United States, England, France, and Bremen. In 1857-'8 the United States exported to Hayti merchandise to the value of \$2,227,609, and imported therefrom to the value of \$2,185,562.—The government of the republic is based on the constitution of 1843; the sovereign power is recognized to be in the people, and is exercised through an elected president. The legislature, or national assembly, consists of a chamber of commons and a senate, the former composed of one or more representatives from each commune, elected for 3 years, and the latter of 6 members from each department, elected for 6 years. The judicial power is vested in a high court of cassation, being the highest tribunal of appeals,

with superior courts in the capitals of departments, and subsidiary and primary courts in the arrondissements and communes. The laws are founded on the civil code of France. The whole powers of the government, however, have usually been concentrated in the hands of the executive, their separation into the constitutional branches having been virtually nominal; and during the reign of Faustin I., the constitution was so modified as to meet the change from the democratic to the imperial form. The public revenue is derived chiefly from customs, navigation dues, monopolies, &c., and averages about \$1,000,000 a year. The expenditures exceed this amount, and hence the public debt has been constantly increasing. The force of the Haytian army is stated at 30,000, but not more than 12,000 to 15,000 are considered as effective. The people profess the Roman Catholic religion, and are under the authority of the bishop of Arcadopolis. In every commune a school on the Lancastrian system is or by law ought to be maintained. In 1854 there were in the country 62 such schools, in which from 9,000 to 10,000 scholars were under instruction. There were also 4 colleges.—Hayti was discovered by Columbus in Jan. 1493, and here at Isabella on the N. shore was founded the first Spanish colony in the new world. St. Domingo was settled in 1496. For nearly half a century these settlements received much attention and rose to great prosperity; but as other parts of America were discovered, the population was drawn off, and the natives having been extirpated, the island again became almost a waste. The buccaneers now settled on the island of Tortuga, opposite Cape François, and also on the N. W. coast, and placed themselves under the protectorate of the French king, who sent them out a governor. In 1697 the inhabitants had greatly multiplied, and, the Spaniards being unable to cope with France, the W. portion of the island was ceded in full to that power. Cultivation was now rapidly extended, and French Hayti soon became the most valuable of all the foreign possessions in the west, and toward the end of the 18th century supplied Europe with one half the sugar consumed by its people. In the mean time the E. or Spanish portion made little or no progress. In 1790 the population of the W. colony numbered about 500,000, of which number 38,360 were of European origin and 28,370 free people of color, the remainder being negro slaves. The free people of color were mostly mulattoes, and some of them had received a liberal education in France and possessed large estates. Still they were excluded from all political privileges, and were not eligible to positions of authority or trust. The great revolution in France was heartily responded to by the whites of St. Domingo, who sent deputies to the national assembly at Paris, and proclaimed the adhesion of the colony to the principles of liberty, equality, and fraternity then in vogue in the mother country. The application of those principles it was intended should be confined exclusively to the whites.

The mulattoes, however, demanded their extension to the free people of color, that is, to themselves. Their demand was rejected with contempt and indignation. A mulatto named Lacombe was hanged for presenting to the legislature of the colony a petition asking for his class the rights of citizenship; and a white planter, M. Beaudière, was torn to pieces by a mob for offering a similar petition on behalf of the mulattoes. Some of the leading mulattoes now resolved to resort to arms. One of the most distinguished of them, Vincent Ogé, who had been educated in Paris and associated there on terms of equality with Lafayette, Brissot, Grégoire, and other eminent men, raised an insurrection with about 300 followers in Oct. 1790. He was defeated, captured, and with his brother broken on the wheel in the most cruel manner; 21 of his followers were hanged. When the news of these executions reached Paris, much indignation was expressed against the colonists, and by the influence of the friends of the blacks, the famous society of *Les amis des noirs*, the national assembly, May 15, 1791, passed a decree declaring that the people of color born of free parents were entitled to all the privileges of French citizens. This decree did not touch slavery or meddle with the slaves, but it excited to the highest pitch the jealousies and apprehensions of the planters, who forced the governor of the colony to suspend its operation until they could appeal to the home government. This refusal of the rights granted to them by express law caused much commotion among the mulattoes, and civil war between them and the whites appeared inevitable, when a third party, little considered by either of the others, unexpectedly interfered. The slaves on the plantations rose in insurrection, Aug. 25, 1791. The whites in alarm consented (Sept. 11) to admit the mulattoes to the civil rights granted them by law, and for a time there seemed some prospect of the restoration of peace. But on Sept. 24 the national assembly at Paris, moved by the remonstrances which had been received from the whites of St. Domingo, repealed the decree of May 15. When the news of this repeal arrived, the mulattoes flew to arms, and the civil war continued with increased ferocity on all sides for several years. Commissioners were repeatedly sent from France, but could effect nothing. The whites themselves were divided into hostile factions, royalist and republican, the French part of the island was invaded by the Spaniards and by the English, and the insurgent blacks and mulattoes under able chiefs held strong positions in the mountains and defied all efforts to subdue them. The French commissioners, involved in difficulties on every hand, at length decided to conciliate the blacks, and in Aug. 1793 proclaimed universal freedom, in apprehension of an English invasion, which took place in the following month. In Feb. 1794, the national convention at Paris confirmed this act of the commissioners, and formally guaranteed the freedom of all the inhabitants of the

French colony. Meantime the English conquered the whole western coast of the island, took the capital, Port au Prince, and besieged the governor, Gen. Laveaux, in Port de Paix, the last stronghold of the French, who were reduced to extremities by famine and disease. At this juncture the blacks, led by Toussaint L'Ouverture, relying on the proclamation of emancipation, came to the aid of the French governor. The siege of Port de Paix was raised, the Spaniards driven back, and after a long contest, during which Toussaint was appointed by the French authorities commander-in-chief of the army, the English in 1797 were expelled from the island, the whole of which, by the treaty with Spain concluded at Basel, July 22, 1795, now belonged to France. Under the energetic administration of Toussaint L'Ouverture, who was now virtually governor of the whole island, peace was restored, commerce and agriculture revived, the whites were protected and their estates restored to them, and a constitution for the colony adopted, acknowledging the authority of France, but making no distinction between the citizens on account of race or color. In 1801, however, Napoleon Bonaparte, then first consul, resolved to restore slavery in St. Domingo. The French legislature at Paris decreed its restoration by a vote of 212 to 65. An expedition, consisting of 66 ships of war and 30,000 veteran soldiers under Gen. Leclerc, was sent to enforce this decree. The army landed at Samana in Feb. 1802, the campaign was commenced, and fought with various success until May 1, when a truce was concluded. During this cessation of arms, Toussaint L'Ouverture was himself taken prisoner and conveyed to France, where he died in April, 1803. Indignant at this act, the negroes rallied and immediately renewed hostilities; the command devolved on Dessalines, who prosecuted the war with vigor and success; and the yellow fever, having broken out in the French army, became a more fearful and fatal antagonist than the marshalled negroes. In the midst of this calamity Leclerc died, and was succeeded in command by Gen. Rochambeau. The first act of this general was the renewal of the armistice, but it proved of no advantage to him; the blacks continued to receive reinforcements and the fever raged violently, and to add to his embarrassment an English fleet appeared off the coast. When the period for which the armistice had been proclaimed expired, his army was reduced to a mere handful of men, powerless for either offence or defence, and was soon after driven into Cape Haytien, where on Nov. 30, 1803, the French general capitulated to the commander of the English squadron. On Jan. 1, 1804, the Haytiens formally asserted their independence; and Dessalines, who had conducted the war to its close, was appointed governor for life. Not content, however, with the simple title allotted to his station, and in imitation of Bonaparte, who had 6 months before grasped the imperial sceptre of France, Des-

salines assumed (Oct. 8, 1804) the title of Jacques I., emperor of Hayti; but his reign was troublous and brief, and terminated in a military conspiracy on Oct. 17, 1806. Hayti was now divided among several chieftains, the principal of whom were Christophe in the north-west and Pétion in the south-west. The E. part of the island was repossessed by Spain. In 1807 Christophe was appointed chief magistrate for life; but in 1811, having become dissatisfied with his present honors, he changed his title to that of king, calling himself Henri I., and had the kingly office made hereditary in his family. Pétion continued to act as president of the south-west until May, 1818, when he died, universally lamented by his people. On the other hand, Christophe by his arbitrary acts provoked the vengeance of his subjects, and shot himself during a revolt against his authority in Oct. 1820; and having ruled as a despot, his memory was as universally execrated as that of his republican compeer was beloved. Boyer, who had succeeded Pétion in power, now united all the governments of the west, and ruled over the whole Haytien territory. The retrocession of the eastern colony had been made at the instigation of the English government; but it was never fully acquiesced in by the inhabitants, and its possession by Spain had since been rather nominal than real. The proximity of a free republic, separated only by a conventional line, was also fraught with danger, and encouragement to revolt was not otherwise wanting. At length the people determined to be as free and independent as their neighbors, and on Nov. 30, 1821, threw off the Spanish yoke and declared their country a republic. Profiting by the dissensions that followed, Boyer, the Haytien president, now invaded the disturbed country, and in 1822 united the whole island under his government. Hitherto France had not acknowledged the independence of its former colony; but in 1823 the recognition was agreed to, on the condition that Hayti should pay 150,000,000 (subsequently reduced to 90,000,000) francs, as an indemnity for the losses of the French colonists during the revolution. Boyer retained the presidency until 1842, when a revolution broke out against his power and compelled him to flee; and soon after the inhabitants of the east rose against the Haytiens, overpowered them, and in 1844 (Feb. 2) formed themselves into an independent state under the style of the Dominican republic. The presidency of Hayti fell to Herrard Rivière, who marched with an army of 20,000 men against the revolted province, but was soon (April 9) compelled to retire within his own borders. His disgraceful retreat was avenged by a decree of banishment. His successor, Guerrier, died in less than a year after his elevation to power; he was succeeded by Pierrot, but the election of this patriot was scarcely completed before he became disgusted with the demoralized condition of the government and retired into private life; and his successor, Gen. Riché, died before

he had fairly entered upon his duties. In 1847 Faustin Soulouque was inducted into power. The new president, following up the policy of his predecessors, which had been interrupted by so many casualties, renewed the attempt to subjugate the eastern republic, and actually carried into its territory an army of 5,000 men. He was opposed by Santana with only 400 men, and signally defeated at Las Carreras on the river Ocoa, April 21, 1849. On his return to the capital he not only managed by his natural cunning to evade the consequence of his failure, but succeeded in concentrating in his own hands the whole power and patronage of the government, and so dispensed it as to attach to himself a strong party, by means of which he was soon after enabled to assume the imperial dignity. On Aug. 26 of the same year he ascended the throne with the title of Faustin I., and caused the constitution to be altered to meet the changed circumstances of affairs; and to consolidate his power, he surrounded himself by a court composed of princes of the blood, dukes, counts, barons, &c., and established two orders of knighthood, that of St. Faustin and the legion of honor. He was subsequently crowned with great pomp. His policy, thus supported by his nobles, became despotic, and his habits too expensive for the condition of the country. His robberies from the public treasury were also large, and the proceeds were sent out of the country for security against future reclamations. At length, however, the burden became intolerable, and in the height of his power his career was arrested. In Jan. 1859, a revolt was raised by one of his own generals, Fabre Geffard, who was instantly supported by the whole population. Finding that not even his own parasites and soldiers were base enough to do him further service, the guilty emperor sought refuge on board an English ship, and sailed for Jamaica. The republic was again proclaimed, and Geffard assumed the chief authority, with the title of president. In Sept. 1859, a band of conspirators attempted his assassination, but succeeded only in murdering his daughter, who was shot through a window of her father's house. The guilty parties were soon apprehended and executed. Since the defeat of Soulouque by the Dominicans, a truce has existed between the two governments which possess this island; it is now probable that a permanent peace may be established. Hayti was the aboriginal name of the island, and signifies mountainous; it was restored, after a disuse for 300 years, by Desalines. (See DOMINICAN REPUBLIC.)

HAYWARD, ABRAHAM, an English writer and translator, born about 1800. His works are: "Statutes founded on the Common Law Reports" (London, 1832); a prose translation of Goethe's "Faust" (1833-'47); translation of Savigny's "Vocation of our Age for Legislation and Jurisprudence" (1839); "Law regarding Marriage with the Sister of a Deceased Wife" (1846); "Juridical Tracts" (1856); "Biographical and Critical Essays" (1858).

HAYWOOD. I. A W. co. of N. C., bordering on Tenn., and watered by Big Pigeon river; area, about 550 sq. m.; pop. in 1850, 7,074, of whom 418 were slaves. It lies between the Blue Ridge and Iron mountain, and has a rough surface with fertile river bottoms. The productions in 1850 were 278,221 bushels of Indian corn, 40,805 of oats, 12,704 of wheat, 8,550 lbs. of tobacco, and 55,405 of butter. There were 10 grist mills, 5 saw mills, 26 churches, and 824 pupils attending public schools. The county was divided in 1850 to form Jackson. Capital, Waynesville. II. A W. co. of Tenn., drained by the Hatchee and the S. fork of Forked Deer river; area, 600 sq. m.; pop. in 1850, 17,259, of whom 8,498 were slaves. It has an even surface, and a fertile, well cultivated soil. The productions in 1850 were 754,510 bushels of Indian corn, 20,967 of wheat, 67,275 of oats, 67,971 of sweet potatoes, 15,967 bales of cotton, and 121,475 lbs. of butter. There were 12 grist mills, 2 saw mills, 24 churches, and 270 pupils attending public schools. Capital, Brownsville.

HAZARD, a game at dice, which requires much calculation, and at which any number of persons may play. The person who takes the box and dice throws a chance for the company, or a main, which must be not less than 4 nor more than 9. He must therefore keep throwing till he brings 4, 5, 6, 7, 8, or 9. The term nick is applied to the company's chance whenever 7 or 8 is twice thrown in succession, or whenever 7 or 8 is followed by 11 or 12; it is also applied whenever any number, which is not that of the company's chance, is followed by the same number directly afterward. The person who throws, or the caster, wins his stakes whenever he throws a nick. Whoever chooses to lay some money with the caster puts it upon the table within a circle reserved for that purpose. Next, after having obtained the consent of the caster, he knocks the box upon the table at the money of the person with whom he wishes to bet, or mentions his name. It is optional with the person who bets with the caster to bar any throw which he may cast, provided neither of the dice is seen; if one die should be discovered, the caster must throw the other to it, unless the throw is barred in proper time. The person who throws a succession of mains undoubtedly wins; but his success is only a matter of chance, whereas he who secures the best odds by calculation succeeds by his powers of mathematical application. This game has been called the "arithmetic of dice."

HAZEL, a small bush, which grows in neglected thickets, producing catkins and small fertile flowers upon the same branches, succeeded by a sweet-kernelled nut. There are two species common to the northern United States, the common or wild hazel and the rostrate or beaked hazel. (See FILBERT.)

HAZLITT, WILLIAM, an English author, born in Maidstone, April 10, 1778, died in London, Sept. 18, 1830. His father, a Unitarian clergyman who was settled for a short time in the

United States during Hazlitt's childhood, sent him to the Unitarian college at Hackney to be educated for the ministry. But Hazlitt had a taste for moral and political philosophy and art, which he cultivated to the neglect of his theological studies, and upon leaving college he determined to become a painter. He painted portraits with tolerable success, but finding he was not likely to reach the high standard which he had set for himself, he renounced the art and embarked in a literary career. In 1805 appeared his essay on "The Principles of Human Action" (8vo., London), which he always considered one of his best literary performances. Thenceforth his principal support was derived from his contributions to the periodicals and his occasional publications and lectures. He became a regular contributor to several London newspapers of political articles and theatrical and art criticisms, the latter of which, notwithstanding a frequent tendency to prejudice and paradox, are remarkable for a catholic appreciation of the subject, and for the earnestness, boldness, and enthusiasm with which they are written. These, with his criticisms on literature and literary men, constitute his chief claim to remembrance. Among his best known works are: "Characters of Shakespeare's Plays" (8vo., London, 1817); "A View of the English Stage" (1818); "Lectures on the English Poets" (1818); "Lectures on the English Comic Writers" (1819); "Table Talk" (2 vols. 8vo., 1821); "Lectures on the Literature of the Elizabethan Age" (1821); "The Spirit of the Age" (1825), containing comments on the leading public characters of the day; an essay on the fine arts in the "Encyclopædia Britannica;" and the "Life of Napoleon Bonaparte" (4 vols. 8vo., 1828), the last intended to be his chief work, and dictated by enthusiastic admiration of his subject. In 1836 appeared his "Literary Remains," with a notice of his life by his son, and thoughts on his genius and writings by Sir E. L. Bulwer and Sergeant Talfourd (2 vols. 8vo.). Hazlitt's free comments upon living authors made him many enemies, and his life seems to have been passed in ceaseless literary labors, although his receipts were frequently large. He was married in 1808, and divorced in 1823, and in the succeeding year was again married. He lived in London during the last 20 years of his life, in a house in Westminster once occupied by Milton.—WILLIAM, son of the preceding, born about 1810, chiefly known in the world of letters by editions of some of his father's works, an edition of the writings of De Foe (3 vols. 8vo., 1840), translations of Michelet's "Roman Republic," Guizot's "History of the English Revolution" (12mo., 1846) and "History of Civilization" (3 vols. 12mo., 1846), Thierry's "History of the Conquest of England by the Normans" (2 vols. 12mo., 1847), and Hue's "Travels in Tartary, Thibet, and China" (1852); and an edition of Johnson's "Lives of the Poets," with additions, from the earliest period to the close of the last generation (4 vols. 12mo., 1854).

HEAD, SIR EDMUND WALKER, a British author and statesman, born in Maidstone, Kent, in 1805. He was educated at Oxford, and after considerable experience in the public service was appointed in 1847 lieutenant-governor of New Brunswick, an office which he held until Sept. 1854, when he succeeded the earl of Elgin as governor-general of Canada. As an author he has written learnedly on art, and has also edited, with notes and a preface, Kugler's "Hand-Book of Painting: the German, Flemish, Dutch, Spanish, and French Schools" (2 vols., 1854).

HEAD, SIR GEORGE, an English author, born near Rochester, Kent, in 1782, died in London, May 2, 1855. He was attached to the commissariat department of the British army during the war in the Peninsula, and was present at all the great battles; he also served in Nova Scotia and the Canadas. He wrote several works illustrating his experiences in the military service, of which that entitled "Forest Scenes and Incidents in the Wilds of North America" is the best known. He also published a "Home Tour," in 2 parts (reprinted as one work in 2 vols., 1840), and "Rome, a Tour of Many Days" (1849). He was a frequent contributor to the "Quarterly Review."—SIR FRANCIS BOND, brother of the preceding, and an English author, born near Rochester in 1793. While an officer in the engineers he received from a mining company an invitation to explore the gold and silver mines of South America, between Buenos Ayres and the Andes. He arrived in Buenos Ayres in 1825, and in a short time had completed the work, having crossed the pampas 4 times and the Andes twice, and ridden upward of 6,000 miles, most of the time unaccompanied. His "Rough Notes," published after his return to England, give a graphic description of his expedition. In Nov. 1835, he was appointed lieutenant-governor of Upper Canada, and held office during the insurrection of 1837, after which he returned home and published a narrative in which he justified the measures he had taken against the insurgents. As an author Sir Francis Head is widely known by his "Bubbles from the Brunnens of Nassau," "Life of Bruce, the African Traveller," "Fagot of French Sticks," and "Fortnight in Ireland." He is an amusing tourist, and records scenes and characters with a minuteness equally removed from tediousness or monotony. He enjoys a pension of £100 for his services to literature.

HEADLEY, JOEL TYLER, an American author, born in Walton, Delaware co., N. Y., Dec. 30, 1814. He was graduated at Union college in 1839, studied at the Auburn theological seminary, was licensed to preach in New York, and was pastor for 2 years at Stockbridge, Mass. Obligated by the failure of his health to abandon his profession, he travelled in Europe in 1842-'3, and after his return published two volumes entitled "Letters from Italy," and "The Alps and the Rhine" (New York, 1845), which were received with favor. Applying himself to literature, he published "Napoleon and his Mar-

shals" (2 vols. 12mo., New York, 1846), a work written for effect, and which has attained a great degree of popularity. It was followed in the same year by the "Sacred Mountains," and in the following year by "Washington and his Generals" (2 vols.). His melodramatic treatment of sacred subjects in the former work was much criticized. Among his later publications are *lives of Oliver Cromwell, Winfield Scott, Andrew Jackson, and Washington*; "Adirondack, or Life in the Woods" (1849); the "Imperial Guard of Napoleon from Marengo to Waterloo" (1852), founded on a popular French history by E. M. de St. Hilaire; a "History of the Second War between England and the United States" (2 vols., 1853); "Sacred Scenes and Characters;" and "Life of General Havelock" (1859). Mr. Healdy resides near Newburg on the Hudson river. In 1854 he was elected a representative in the legislature, and in 1855 was chosen secretary of state of New York for the term of 2 years ending Dec. 31, 1857.

HEALY, GEORGE PETER ALEXANDER, an American painter, born in Boston in 1808. He went to Paris about 1836, where he remained several years, alternating his residence there with occasional visits to the United States. Among the pictures executed by him abroad are portraits of Louis Philippe, Marshal Soult, Gen. Cass, &c. At home he has painted Calhoun, Webster, Pierce, and other prominent American statesmen. He has occasionally produced large historical pictures, of which "Webster's Reply to Hayne," illustrating a well known scene in American legislative history, was completed in 1851, and now hangs in Faneuil hall in Boston. At the great exhibition of Paris in 1855 he exhibited a series of 13 portraits and a large picture representing Franklin urging the claims of the American colonies before Louis XVI., for which he received a medal of the 2d class. Of late years Mr. Healy has resided in Chicago, and among his most recent works is a portrait of President Buchanan.

HEARD, a W. co. of Ga., bordering on Ala., and intersected by the Chattahoochee river; area, 286 sq. m.; pop. in 1852, 6,955, of whom 2,329 were slaves. The surface is hilly and well wooded with oak, hickory, and pine. Gold, lead, and iron have been found, and the soil is generally rich. The productions in 1850 were 265,242 bushels of Indian corn, 35,034 of oats, 41,354 of sweet potatoes, and 3,884 bales of cotton. There were 24 churches and 403 pupils attending public schools. Value of real estate in 1856, \$888,033. Capital, Franklin.

HEARING. See *ACOUSTICS*, and *EAR*.

HEARNE, SAMUEL, an English explorer, born in London in 1745, died in 1792. In early life he served as a midshipman under Hood, but upon the conclusion of the 7 years' war he entered the employment of the Hudson's Bay company, at whose request he made several journeys into the northern regions of British America in quest of a N. W. passage and of mines of the precious metals. In 1770-'71 he pene-

trated as far as the Coppermine river, which he descended about 30 miles to the Arctic ocean, thus determining the possibility of reaching the northern coast of America. He was promoted for these services, and in 1787 returned finally to England. In 1795 appeared his "Journey from the Prince of Wales's Fort, in Hudson's Bay, to the Northern Ocean; undertaken by order of the Hudson's Bay Company for the Discovery of Copper Mines, a North-West Passage, &c., in the Years 1769, 1770, 1771, and 1772" (4to., London).

HEARNE, THOMAS, an English antiquary and author, born at White Waltham, Berkshire, in 1678, died June 10, 1735. He was graduated at Oxford in 1699, and became janitor of the Bodleian library in 1701, and in 1712 second librarian. Three years later he was appointed archtypographus of the university and esquire beadle of civil law; but being a strong Jacobite, he was soon after compelled to resign his offices, from his refusal to take the oath of allegiance to George I. Throughout his life he continued to entertain opinions hostile to the house of Hanover, and frequently introduced them irrelevantly into the prefaces to books which he edited. His plodding industry, as well as his irritable temper, brought upon him the ridicule of many contemporary satirists, and Pope has described him in the "Dunciad," under the name of "Wormius," as "in closet close ypent, . . . on parchment scraps yfed." Among Hearne's most valuable publications, which amount to over 40, and the greater part of which were printed by subscription at Oxford, are the "Life of Ælfred the Great" from Sir John Spelman's manuscript in the Bodleian library (8vo., 1709); Leland's "Itinerary" (9 vols. 8vo., 1710-'12); Leland's "Collectanea" (6 vols. 8vo., 1715), &c.

HEART, a hollow muscular organ placed in the cavity of the chest between the lungs and above the diaphragm, which separates it from the stomach. It is somewhat conical in shape, the axis of the cone being directed obliquely from its upper extremity downward and forward to the left. The base of the cone is the upper part of the heart; its apex is the lower. The great mass of the heart is behind the sternum in the middle of the chest, but the apex extends into the left side of this cavity. The upper border of the heart is just behind a line that would unite the third costal cartilages; the apex of this organ corresponds to the interspace between the cartilages of the 5th and 6th ribs, nearly 2 inches below the left nipple. In the adult, the heart is about 5 inches in length, $3\frac{1}{2}$ in breadth, and $2\frac{1}{2}$ in the antero-posterior diameter. The weight of the heart varies according to the weight of the body, and the proportion usually is nearly 1 to 170 in males and 1 to 150 in females. According to most anatomists, it averages from 10 to 12 ounces in the adult male, and from 8 to 10 in the female; but Bouillaud says the average weight in adults is only a little more than 8 ounces. In old

age it is larger than in middle life.—The heart is essentially composed of 4 cavities or chambers; the two upper ones are the auricles, the lower ones are the ventricles. The auricles receive the blood brought by the veins to the heart, and the ventricles are the parts from which the blood is sent to the various organs. The right auricle receives the blood from the whole body except the lungs, and the left auricle the blood from the lungs. (See CIRCULATION.) In adults the two auricles have no communication with one another, but both have a large aperture of communication with the ventricles. Their walls are much thinner than those of the ventricles; they are both in continuity with the largest veins of the body. The right auricle is the larger and thinner; it is an enlargement of the two *venæ cavæ*, united with the right ventricle and separated from the left auricle by a muscular wall. Many openings may be seen on the internal surface of this auricle: 1, on the posterior and inferior part, the very large opening of the inferior vena cava; 2, on the upper and front part, the superior vena cava; 3, on the posterior and lower part, the coronary sinus by which the blood returns from the substance of the heart; 4, between the right auricle and the corresponding ventricle, the auriculo-ventricular opening; 5, many minute apertures through which a number of small veins throw blood into the auricles. In the right auricle of the adult we find several parts which are vestiges of the foetal heart; for instance, the Eustachian valve, which is much diminished; the *fossa ovalis*, usually a simple depression on the interauricular walls, where an opening exists in the foetal heart, which may remain in adults and allow a mixture of the black and the red blood. Both the right and left auricles have an appendix, the shape of which has some resemblance to a dog's ear. The muscular walls of the appendices are very thin, and their cavity is a continuation of that of the auricles. In the two appendices there are small muscular columns, some of which are cylindrical, running transversely across the inner surface of those extremities and of the adjoining parts of the auricles. These columns, called *musculi pectinati*, on account of their resemblance to the teeth of a comb, are more numerous and larger in the right than in the left appendix. The left auricle presents 5 openings; one is the aperture communicating with the corresponding ventricle, while the 4 others belong to the pulmonary veins. These last openings are placed very near one another, and sometimes, instead of the two by which the red blood comes from the left lung into the auricle, there is but one large aperture on account of the merging of the two left pulmonary veins. The two ventricles constitute a much larger portion of the heart than the auricles. The walls of the left ventricle are notably thicker than those of the right; and while the latter ventricle is thicker near its base than elsewhere, the left one is thicker in its middle part than at

the base or at the apex of the heart. The right ventricle is somewhat pyramidal, and the other conical. The left ventricle is longer than the right, and forms almost alone the apex of the heart. The right ventricle is often called anterior, on account of its being placed almost entirely in front of the other. In the two ventricles we have to study nearly similar parts, which are the openings, the valves, and a peculiar apparatus chiefly destined to move some of the valves. Two openings exist in each ventricle, the auriculo-ventricular and the opening of the two principal arteries of the body. The auriculo-ventricular opening is the aperture of communication between the auricles and ventricles; the larger opening belongs to the right ventricle. These two openings are nearly an inch in diameter; they are surrounded by a ring of fibrous tissue, to which are attached the valves which will be described below. In the right or anterior ventricle we find the opening of the pulmonary artery, which is in front of the auriculo-ventricular aperture, near the wall which separates the two ventricles (the *septum ventriculorum*). In the left ventricle is the opening of the aorta, in front and to the right of the auriculo-ventricular aperture. The semilunar valves surround the orifices of the aorta and of the pulmonary artery, in each of which they consist of 3 semicircular folds of the *endocardium*, the lining membrane of the cavities of the heart, with an addition of fibrous tissue. Between each valve and the corresponding part of the aorta or pulmonary artery there is a pouch due to a partial dilatation of these vessels. The valves have an upper border (the free one), which is straight, and a lower or adherent one, which is convex. The other system of valves found in the heart differs in its two ventricles; in the right one the system is composed of 3 triangular segments, and in the left of only 2; the first forms the tricuspid valve, the second the mitral valve. Both are composed of double folds of the lining membrane, with an addition of fibrous tissue, and probably of some muscular fibres. They adhere to the margin of the auriculo-ventricular opening, and give insertion by their lower surface and their free margin to a number of tendinous cords, the *chordæ tendineæ*. The disposition of the various parts of the valvular apparatus in the ventricles is such that when these two muscular pouches contract (which action is called systole), the blood tending to pass by the 4 openings pushes open the semilunar valves and escapes freely by the two arterial trunks; while, on the contrary, the tricuspid and mitral valves are pushed upward and prevent the reflux of this liquid into the auricles. The reverse takes place at the time of dilatation or diastole of the ventricles; the blood tends to return into the dilating ventricles, and pushes down the semilunar valves, which at once completely prevent its falling into the ventricles; while, on the contrary, the mitral and tricuspid valves relax. In the two ventricles a large number of muscular columns

(*columnæ carneæ*) are found. These columns are rounded, and originate from almost all the parts of the inner surface of the ventricles, upon which they interlace in all directions. There are 3 kinds of muscular columns: 1, those which are adherent all along their length with the wall of the ventricles; 2, those which are free in their middle and adherent by their two extremities; 3, those which adhere by one extremity to the ventricular wall, and by the other are attached to tendinous cords inserted upon the auriculo-ventricular valves. The heart is covered outside by two membranes, constituting the *pericardium*, and lined inside of its cavities by a thin membrane, the *endocardium*. The pericardium consists of a strong layer of fibrous tissue attached to the fibrous part of the diaphragm and to the areolar tissue investing the large blood vessels springing from the heart. It is a membranous bag fixing the position of the heart. The inner surface of this fibrous bag is lined by a very thin membrane, which is the serous pericardium, extending also over the outer surface of the heart, which it covers entirely. The endocardium is an extremely thin membrane which lines all the cavities of the heart, and is a continuation of the inner or epithelial membrane of the blood vessels. It is composed of a superficial layer of epithelium, placed upon a delicate stratum of fine fibres of fibrous tissue. The various valves of the heart are chiefly formed by folds of this membrane.—The muscular tissue of the heart presents several interesting characters. In man and the higher vertebrates it belongs essentially to the variety of striated or striped muscular fibres, but the stripes are less marked and the fibres thinner than in the muscles of animal life, and the fibres present the important peculiarity of branching and anastomosing one with another, so that the whole muscular fabric of the ventricles and that of the auricles may be considered as two complicated and inextricable networks of muscular fibres. Another peculiarity of the heart is, that there is no areolar tissue, or but little, between the fibres, while in other muscles there is a considerable quantity of this tissue between fascicles of fibres. In consequence of the interlacement of the fibres of the heart, it is very difficult to ascertain their disposition; but if, instead of trying to follow up small fascicles of fibres, we study the arrangement of large bundles or bands, we find that there are two distinct divisions of the fibres of the heart: 1, those belonging to the two ventricles or the two auricles; 2, those which belong only to one of these pouches. The bundles common to the two ventricles seem to emerge from the apex and to cover the anterior and posterior surfaces of the heart. At the base of the ventricles many of them are inserted upon the fibrous zone placed between these pouches and the auricles. At the apex of the heart these bundles partly pass inside of the walls of the heart, and partly pass obliquely from right to left on the posterior surface,

and from left to right on the anterior surface. The bundles of fibres belonging properly to but one of the ventricles are chiefly transversal and circular, so that their general direction is perpendicular to that of the fibres common to both ventricles. The bundles of fibres common to the two auricles are transversely placed on the anterior and lateral surfaces of the auricles. The bundles belonging properly to but one auricle are circular or spiral, and they cross one another in several directions. Around nearly all the venous or other openings of the heart there are bundles of circular fibres, forming a kind of sphincter.—Two arteries, the anterior and the posterior coronary, furnish red or arterial blood to the tissue of the heart; they originate in the aorta near its origin. The veins are more numerous, as, beside the great cardiac vein, there are many smaller ones. The nerves of the heart come from two sources, the par vagum and the sympathetic. A peculiar anatomical feature of the heart is that it contains many small nervous ganglia, most of which can be seen only with the aid of a microscope.—Like all the other muscles of living animals, the heart is endowed with irritability, *i. e.*, the power of contracting after excitation or stimulation. The heart is among the organs in which irritability lasts longest after death. It is not true, however, that, as stated by many physiologists, the heart is always the last organ to lose its vital properties. Fontana showed that the muscles of animal life (those of the limbs and trunk) often remain irritable longer than the heart; Dr. Brown-Séquard has shown that the iris, the diaphragm, and also the muscles of the limbs, very often remain much longer irritable than the heart, not only in animals but also in man. The cases of longest duration of irritability after death, in man, recorded by Nysten, are, for the heart, 16½ hours, and for the muscles of the limbs, 27 hours. Carpenter, with almost all physiologists, says that the irritability of the heart is much less speedily destroyed in cold than in warm-blooded animals. This is not always true. Remak has seen irritability continue two days in the heart of birds and mammals; Brown-Séquard, from 31 to 34 hours in Guinea pigs and rabbits, and 53 hours in dogs; and M. Vulpian, 53, 57, and even more than 93½ hours in dogs. So far as we know, this exceeds the greatest duration of the irritability of the heart in cold-blooded animals. Most physiologists, also, say that in newly born animals the irritability of the heart lasts longer after death than in adults. This is true only in certain circumstances, and especially when the temperature of the newly born animal has been much diminished before death. Very frequently the heart remains much longer irritable in adults than in newly born creatures.—As long as life lasts the heart has movements which afford a most interesting study. We will first examine the circumstances relating to the persistence of these movements after death. In normal conditions the two auricles contract

together, and push the blood into the ventricles, which, after having been distended by this liquid, contract in their turn and force the blood into the pulmonary artery and the aorta. On account of their perfect regularity these movements are called rhythmical. Whatever be the cause of rhythmical action of the heart, it seems to be in this organ itself, as when the heart is taken out of the chest it continues to move rhythmically. Even parts of the heart separated from the rest, as shown first by Haller, continue, though but for a short time, to have rhythmical movements. The movements of the heart may persist for a long while after death. Boyle has seen them continue 7 hours, and Hooke more than 12 hours, in newly born dogs; M. Vulpian has seen the auricles of a dog moving regularly $26\frac{1}{2}$ hours after death, and M. Rousseau states that, in a woman decapitated at Rouen in 1808, the 4 parts of the heart had regular contractions and relaxations 29 hours after death. We feel inclined to doubt the correctness of this statement, as we find that the rhythmical movements of the ventricles, if not of the auricles, had ceased entirely in less than one or two hours in 23 decapitated men, observed by Nysten, Rochard, Brown-Séquard, Harless, Kölliker, &c. In 4 criminals, hanged in Boston and Philadelphia, the movements of the heart had stopped in much less than an hour. When the movements of the heart have ceased, it is usually possible for a time to reproduce them. Any kind of excitation, such as a puncture, a pressure, the influence of water, of acids, of alkalies, of heat, of galvanism, &c., may renew for a few minutes or a much longer time the regular contractions and relaxations of the heart. We have already said that the heart may have its rhythmical action, although separated from the body, and therefore deprived of the action of the cerebro-spinal axis. We may add that the researches of Bidder on the spinal marrow, and those of Brown-Séquard on the medulla oblongata and the rest of the encephalon, show that the extirpation of these nervous centres, in certain animals, does not necessarily cause death, and, still more, frequently allows life and therefore the movements of the heart to continue for many months, without any apparent alteration. Moreover, it is well known that the heart has regular movements during the intra-uterine life in monsters deprived of any part of the cerebro-spinal centres. It seems, therefore, that we ought to reject entirely the views of Legallois and others, who considered the spinal cord or the medulla oblongata as the source of excitation of the movements of the heart. But if those parts of the cerebro-spinal axis have not the function which was attributed to them, they have undoubtedly a very great influence upon the heart, either to stop or diminish, or to increase or disturb, its rhythmical action.—There is a peculiar influence of the nervous system upon the heart which is still insufficiently known, although it is of the

greatest importance; we mean that by which the heart's action is completely or incompletely stopped at once, and through a peculiar agency of the par vagum, one of the nerves of the heart. This stoppage of the rhythmic movements of the heart is the usual cause of death when it occurs suddenly after an emotion, after a wound (without much hæmorrhage) of the abdomen, after a blow on the cardiac region, after certain injuries to the medulla oblongata or the medulla spinalis, after drinking cold water on a warm day, after a shower bath, &c. It is in this way also that, in a few cases, chloroform has caused death. Dr. Brown-Séquard has ascertained that when the heart is stopped by this peculiar influence of the nervous system, it is usually easy to set it in action again by mechanical excitation made by pressing upon it through the walls of the chest. He has found that every effort of dilatation of the chest, in inspiration, is associated with some retardation of the heart's action. Taking notice of this fact, on the one side, and, on the other, of the most important fact that when respiration is not free the movements of the heart increase in frequency and energy, it seems quite rational to recommend, as was done empirically by an author of the last century, to stop respiration for a short time (half a minute or a little more) in cases of syncope. The nervous centres may act also upon the heart to produce an augmentation or a disturbance in the movements of this organ; but whether these modes of influence are direct or not is not yet positively decided. It is certain, however, that at least in many cases it is through a disturbance of the respiratory function that an increase or irregularities in the movements of the heart are produced. Most of the German physiologists now admit that the cause of the rhythmical movements of the heart is a peculiar influence exerted by small nervous ganglions that are found in this organ. But it seems very improbable that the rhythm of the heart's action depends upon those small ganglions. In the first place, the heart in the embryo, before the formation of the nervous system in its tissues, when even the muscular fibres are not yet formed, is composed of cells, which have regular movements; in the second place, the various veins in the neighborhood of the heart, although there is no ganglion in them, have rhythmical contractions, as was well shown by Allison of Philadelphia; in the third place, all the contractile tissues of the body, although without ganglions, may, as shown by Brown-Séquard, have rhythmical movements.—Muscular irritability in the heart, as everywhere else, seems to depend upon a peculiar influence of blood. The movements of the heart, therefore, as they are simple manifestations of the irritability of the muscular tissue of that organ, depend also upon the action of the blood. Experiments made by Erichsen show that ligatures upon the arteries of the heart are soon followed by the cessation of its movements. More decisive facts published by Brown-Séquard show that

when not only the movements but also the irritability of the heart have ceased, an injection of blood into the coronary arteries may restore both the irritability and the movements of this organ. We cannot enter here into the exposition of the principal views of the cause of the rhythmical movements of the heart, but it seems most probable that this cause consists in a peculiar change taking place in the muscular fibres of the heart, and that this change is due to the influence of certain principles existing around these fibres.—Much discussion has taken place concerning the direction of the movements of the heart. Harvey and two able American experimenters, Drs. Pennock and Moore, assert that when the ventricles contract they elongate and their apex protrudes. Most other physiologists affirm, on the contrary, that the ventricles shorten. These two statements may be reconciled; the writer has seen the ventricles shorten in dogs as long as the movements of the heart were vigorous, and elongate when they became feeble. Carpenter states that the apex of the ventricles when they contract describes a spiral curve from right to left and from behind forward. The truth is that it is from left to right that the point is directed. Harvey thought that the heart, at the time of the ventricular contraction, strikes the wall of the chest by its apex. This view is no longer admitted; almost all physiologists think that it is by the middle or the upper part of the right ventricle that the heart strikes the breast. Strange to say, it is still a debated question whether the beating takes place during the systole or contraction of the ventricles, or during their dilatation or diastole.—Two sounds accompany the movements of the heart; one of these sounds, known as the first, is dull and prolonged, while the second is sharp and short. The first sound coexists with the beating of the heart and the pulsation of arteries; the second is produced a very short time after the first. The principal cause of these sounds is the sudden tension of the valves of the heart. The first sound is principally due to the sudden tension of the auriculo-ventricular valves when the ventricles contract; the second sound is chiefly due to the tension of the valves at the origin of the aorta and of the pulmonary artery. Other causes add their action to the preceding for the production of these two sounds, or of one of them; we will only mention the impulse of the heart against the wall of the chest, the muscular contraction, the collision of the particles of the blood with each other, and the friction of this liquid against the walls of the heart and against the mouth of the aorta and of the pulmonary artery. (See BLOOD, CIRCULATION, PULSE, &c.)—DISEASES OF THE HEART. The heart may be affected with violent palpitation or with irregularity of action without the presence of organic disease, and it is not always easy to discriminate such cases; the absence of increased dullness over the cardiac region, of all signs of valvular affection, and the fact that the point of

the heart is felt to strike in its normal position, are our surest guides. Such cases are usually connected with undue excitability of the nervous system, with derangement of the stomach, or with the abuse of tobacco. The serous sac enveloping the heart may be inflamed, constituting pericarditis. The symptoms of this disease are frequently trifling; the most common is pain referred to the cardiac region or to the epigastrium, and extending sometimes toward the left shoulder. The pulse, often quite unaffected, may be frequent and irregular; dyspnoea is not commonly marked, though in rare cases it may become so severe that the patient is unable to assume the recumbent posture (orthopnoea). In the course of the disease lymph is effused, by which the opposite surfaces are roughened; afterward serum may be poured out, distending the sac of the pericardium. When recovery takes place, the two surfaces of the pericardium are found adherent, thus to a greater or less extent obliterating its cavity. Rheumatism and Bright's disease are the most common causes of pericarditis. Sometimes it arises from an extension of inflammation from the neighboring pleura, and it may result from external injury. For the diagnosis of pericarditis we must rely mainly on the physical signs. Early in the disease there is developed over the heart a friction sound commonly double, superficial, limited in extent, and not heard along the course of the great blood vessels. Where the disease proceeds on to effusion, as this increases, the friction sound may be gradually lost, at the same time that the area of the heart's dullness as discovered by percussion is markedly increased. Pericarditis is not an uncommon disease, and in itself is commonly attended with little danger; when however the inflammation affects the muscular substance of the heart, the affection becomes one of the gravest character. It commonly requires little treatment; the local abstraction of blood from the cardiac region, and the enforcement of rest with proper regimen, are all that will be found necessary; when effusion has taken place, diuretics may be resorted to; the employment of mercurials is advocated by many practitioners. Occasionally pericarditis is of tubercular origin. Tubercles deposited beneath the pericardium give rise to inflammation, and the plastic matter exuded becomes a nidus for a new formation of tubercle. Such pericarditis is essentially chronic, and like tubercular peritonitis it may exist where there is no corresponding development of tubercle in the lung. The disease may be suspected when in a tuberculous constitution pericarditis arises without the coexistence of Bright's disease or rheumatism, or pleuropneumonia, or without the reception of an external injury. In its treatment the patient's strength should be early supported, and while counter-irritation may be employed, cod liver oil, iodine, and the preparations of iron may be administered with some prospect of benefit.—*Endocarditis*. The lining membrane

of the heart, particularly in the course of acute rheumatism, is liable to inflammation, and consequent to this inflammation the valves become thickened, contracted, or deformed by the deposition of fibrinous concretions on their free edges. The general symptoms of the disease are not well marked; febrile reaction, some local uneasiness about the heart, and the occurrence of murmur at the apex or the base, are those most commonly met with. Rest, regimen, and depletion are the remedies most to be relied on. Endocarditis in itself is very rarely a serious complaint, but it leaves behind it valvular disease, the valves becoming incompetent to the perfect performance of their office, either opposing the free flow of the blood in its proper course, or permitting its regurgitation into the cavity from which it had just been thrown; and this again leads to secondary changes in the structure of the heart itself. When a valvular murmur is once produced, it remains permanent unless it becomes inaudible from an enfeebled action of the heart.—*Hypertrophy and Dilatation.* The general mass of the heart, as well as its separate parts, are liable to become enlarged, either from an overgrowth of its muscular substance, or from the dilatation of its cavities, or from the combination of both. Both alterations produce an increased area of cardiac dullness, and in both the apex of the heart strikes below and to the left of the normal point. In hypertrophy the impulse of the heart is heaving and forcible, the pulse, if there be no valvular complication, full and strong, the first sound of the heart prolonged; while in dilatation the first sound is short and clear, the impulse feeble, and the pulse weak. Hypertrophy of the heart is almost always caused by some obstruction in the course of the circulation beyond the hypertrophied part; in most instances this obstruction is valvular, or it may be an aneurism or diseased aorta, or some peculiar condition of the blood, as in Bright's disease. Hypertrophy or dilatation with valvular disease, though often compatible with a prolonged and useful existence, sooner or later, if the patient escape death from syncope or apoplexy, gives rise to congestion of the lungs and liver, and finally to general dropsy.—The treatment of these diseases consists largely in the avoidance of all physical and moral causes of undue excitement, in the employment of a simple and digestible but nutritious diet, and in the use of passive rather than active exercise. As anæmia greatly increases the violence of the heart's action, the preparations of iron are often useful. When congestions or dropsy supervene, they must be met with suitable treatment.—The heart is subject to changes of consistence, and among these the most important is fatty degeneration. Here the muscular fibre of the heart is affected, becoming in part replaced by fatty and granular matter. The disease is best discriminated by the general signs of fatty atrophy, by the feebleness of the heart's action and sounds, and by liability on any exertion to great irregularity

or frequency of the pulse. It is in cases of such degeneration that the greater number of instances of rupture of the heart itself, which sometimes though rarely occurs, are to be found. These cases, when independent of external injury, occur more frequently in the male than in the female, in advanced than in early life. The immediate cause of the rupture is to be sought in some sudden congestion of the heart, produced by violent effort, sudden passion or emotion, the shock of the cold bath, or otherwise. Death is commonly immediate, or at most is delayed but a few hours. Rupture of one or more of the *chordæ tendinæ*, or of one of the valves, though still rare, occurs more frequently than rupture of the heart itself. Faintness, precordial anxiety, palpitation, and irregularity of the pulse come at the moment of the accident, and if a valve be injured are attended with the murmur diagnostic of the injury.—The heart is sometimes affected with aneurism, this being confined almost exclusively to the left ventricle. It may consist in a gradual and uniform dilatation of a portion of the wall of the heart, or in a sudden pinching of the wall with a more or less constricted orifice. Its diagnosis is obscure, the disease presenting few or no symptoms unless very extensive, when the symptoms are common with those of dilatation of the heart. The patient either dies suddenly from rupture of the aneurism, or is worn out by the embarrassment of the circulation and its attendants, congestion and effusion. Occasionally both tubercle and cancer attack the heart, but only as part of a general disease whose principal manifestations are shown in other organs. They present no peculiar symptoms, and are not subjects of treatment. The heart is liable to be detrued from its natural position by various intra-thoracic diseases, most commonly and to the greatest extent by pleurisy with effusion. With extensive pleuritic effusion on the left side the heart may beat beneath or even to the right of the right nipple. These cases are readily distinguished by the coincidence of the signs of pleurisy. As, however, the heart is sometimes placed congenitally on the right rather than on the left side, difficulty of diagnosis may occur. This will be obviated by recollecting that when the heart is thus congenitally misplaced, the liver is likewise transposed to the left side, while the spleen is found on the right. Such displacements produce no symptoms.—In rare cases calcareous matter is deposited in the pericardium, often in altered and diseased valves, particularly in old persons. Such cases have given rise to the accounts of hearts converted into bone, and the like, which are mere popular exaggerations.

HEAT (Saxon, *hæt*), the name both of a certain primary sensation which can be defined only by its synonymes, warmth, calidity, &c., and also of the unknown agency or cause that produces the sensation, together with a great variety of phenomena in the material world. All bodies with which we are familiar are in-

cessantly under the influence of this agent, its presence being an indispensable condition toward fitting the globe on which we are for the habitation of life and intelligence. (See CENTRAL HEAT, and ANIMAL HEAT.) In this article will be considered those fundamental laws of the action of heat upon bodies generally which constitute the science of thermotics, with some reference to applications and to the relations of heat to other forces. Our sensations, as well as observations upon bodies, teach us that heat can exist or manifest itself through a wide range of variation. A given point or intensity in this range forms a certain degree of heat, and constitutes the temperature of the body or space affected by it. 1. Changes of temperature are accompanied by changes in the volume of bodies. As a rule, all bodies undergo an increase of volume (expansion or dilatation) while heated, and a corresponding diminution (contraction) upon cooling. Supposing, now, a convenient substance found, the expansion of which shall be, through a wide range, exactly proportional to the sensible temperature imparted to it; it is evident that the observed expansion of such substance will indicate the existing temperature, and show its variations. In the common method with us of measuring temperatures, a range equal to $\frac{1}{180}$ of the variation between the freezing and boiling points of water, as shown by the expansion of mercury, is taken as the unit or single degree (1°) of sensible temperature; the succession of degrees of this magnitude constitutes Fahrenheit's scale. To our sensations, a body is hot or cold according to the difference of its temperature from our own; but our sense of heat is inaccurate, and often fallacious. If, having one hand in a vessel of warm, and the other in one of cold water, we at once immerse both in water of a mean between the two temperatures, this will be felt as warm by the hand removed from the colder liquid, and as cold by the other. Heat and cold, as known to us, are relatively, not absolutely different; they are only higher or lower degrees of heat. Increase in length of bodies, due to heat, is termed linear expansion; and increase in volume, cubical expansion. (See EXPANSION.) A few facts may here be added. Solids expand least of all; but their enlargement is easily made sensible, and, by an apparatus in form of the pyrometer, measurable. Under the same augmentation of heat, different solids expand very differently. Kopp finds that certain crystals, as fluorspar, aragonite, &c., expand more than many of the metals, which were formerly ranked first; and the rate of expansion of ice, could it be observed through the same range, is greater than that of any metal, being, between 32° and 212° , one part in 267. Wood expands chiefly in a direction transverse to its fibres, very little in length; and hence wood, as well as lucullite, has been used for pendulum rods. The contraction of bodies upon cooling is sometimes not so great as their previous expansion; perhaps it is never so great. Some

bodies, it is certain, become permanently elongated by repeated heating; hence it is that the bars of old fire grates are often found distorted; and lead pipes conveying hot water have lengthened several inches in a few weeks, being thrown into curves. Glass without lead, and platinum, expand so nearly alike, that they can be soldered or otherwise united in machinery, and exposed to heat or cold without being caused to separate. Most substances expand more rapidly, some very violently, as in ascending they approach the melting or vaporizing point; and in descending, they contract correspondingly just before and after condensation or solidification. In sulphuric acid no such inequality is observed; in water, cast iron, bismuth, and antimony, the result at the melting point is the reverse; but in sulphur, phosphorus, mercury, &c., especially near the freezing point, the disturbance is very marked. Mercury contracts so violently just before and after freezing, at -39° , as to have led some observers into the error that it may freeze indifferently at -38° , -42° , or even -46° . The force with which bodies expand and contract is enormous, and in practical operations must always be allowed for. In middle latitudes, the variation between summer and winter temperatures may be stated at not less than 80° . In iron bars or beams abutting against or immovably fixed in walls, there is in consequence generated an immense pulling or pushing force; this, in a bar no more than 10 feet long, has been calculated at not less than 50 tons to the square inch, acting through the minute distance of the elongation or contraction. Hence, the ends of railway bars cannot be allowed to come into absolute contact; and the parts of buildings or bridges must be fitted to slide or play to a certain extent upon each other. Acting upon the arches of an iron bridge, the sun's heat during the middle of the day has caused an elevation of an inch or more; and a single one of the gigantic tubes of the Britannia tubular bridge has been lengthened from 1 to 8 inches during a hot day, warping toward the exposed side—the tubes, to allow of this play, being on rollers. The Bunker hill monument, a granite obelisk, 221 feet high, is during a bright day so expanded on the side toward the sun, that its top is swayed through an irregular ellipse, returning to perpendicularity only when all its sides are of equal temperature, as on cloudy days or in the night. The snapping of stoves while heating or cooling, of trees in extremely cold weather, and the breaking of thick glass or earthen vessels by very cold or hot liquids, are illustrations in different ways of the principle under consideration. The fracture of glass vessels in heating is avoided by making them very thin, by applying heat gradually, or by thinly coating them without with a conducting body, as copper. (For certain compensations of expansion, see CLOCKS AND WATCHES.) Liquids are more expandable than solids; but they differ widely among themselves. From 32° to 212° , pure water expands in volume about 1

part in 22½; fixed oils, 1 in 12. Among solids, those of lowest points of fusion, and among liquids, those most volatile, are in the greatest degree expandible. Expansion in liquids occurs with enormous force, but its effect is usually in part compensated by enlargement of the containing vessel; and because of the latter change, the apparent is usually less than the absolute expansion of a liquid. 11. Heat is communicated in various ways, through bodies or spaces. These may be summed up in: 1, conduction, occurring mainly in solids, and consisting in a process by which a substance passes the heat it may receive from particle to particle through its mass; 2, convection, or carrying, occurring in all fluids, in which heated particles rise by their superior levity, conveying their heat with them, to be given out to other parts; and, 3, radiation, occurring through space, and through certain bodies, solid or fluid, termed diathermanous, a phenomenon analogous to the transmission of the rays of light. The conductivity of different solid substances is at once proved and roughly compared by attaching at equal distances along rods of them small weights, as marbles, by wax, and then applying a high heat at one end of the rods. In a homogeneous rod of any metal, the bits of wax will be melted in regular succession; but in some of the rods this travelling of heat will be much more rapid than in others. It is by its rapid conduction of heat that a silver or copper vessel receiving a hot liquid is at once too warm to be held in the hands; while, from want of this property, a glass or earthen vessel can be grasped very near to the portion in contact with boiling water. So, the hand is burned by seizing a metallic rod red-hot at one end; but not by grasping a wooden rod even nearer to the higher heat of a burning part. Thus all bodies are divisible into the classes of good and poor conductors of heat, though among solids this property is possessed in very variable degree. Liquids and gases do not conduct heat in any degree appreciable by ordinary means; a thermometer inserted a little below the surface of water on which either is burning, or a hot body laid, is scarcely affected; and a mass of air cannot be heated by contact of a hot body above it. But the differing conductibilities of solids, among which silver stands highest, the metals generally best, and all porous and heterogeneous substances, as wood, ashes, the hairy coverings of animals, the plumage of birds, and woven fabrics, owing to constant change of conducting medium from solid to air, very low, afford results of the highest importance in view of the comforts and the arts of mankind. Unfortunately, the tables of conducting power prepared by different observers are somewhat at variance. The latest results are those of Calvert and Johnson: silver, 100; gold, 98.1 to 84; copper, rolled, 84.5; mercury, 67.7; aluminum, 66.5; zinc, forged, 64.1; iron, forged, 43.6; platinum, 37.9; cast iron, 35.9; lead, 28.7; bismuth, 6.1. They found that .01 of impurity often reduced the

conducting power by $\frac{1}{4}$ to $\frac{1}{5}$. In metals, moreover, the power of conducting has been found to diminish with rise of their temperature. A very useful table for practical men is that of Mr. Hutchinson, in which the substances are placed in the order of their resistance to the passage of heat, or of their relative warmness for building material, slate being taken as the unit, and lead being last, as the best conductor in the list: thus, plaster and sand, 18.70; plaster of Paris, 20.26; Roman cement, 20.88; lath and plaster, 25.55; fir, 27.61; oak, 33.66; asphalt, 45.19; Napoleon marble, 58.27; brick, 60.14; fire brick, 61.70; Lunelle marble, 75.41; various kinds of stone, 61 to 95; slate, 100; Yorkshire flag, 110.04; lead, 521.34. Bodies perfectly homogeneous, and crystals of the regular system (monometric), conduct heat with equal facility in all directions. Tyndall has found in wood 3 unequal axes of heat conduction, cohesion, and permeability to liquids, which coincide with each other, the greatest with the greatest and the least with the least, and with the axes of elasticity discovered by Savart. Of these, the greatest is that parallel to the fibres, the least that perpendicular to the fibres and parallel or tangential to the rings, and the mean that perpendicular to the fibres and also to the rings. Thus, in cutting staves for casks, it is well known that these must be cut across the rings, the direction tangential to the rings being that of least permeability. The heat-conducting power of wood bears no definite relation to its density. American birch, one of the lightest woods, conducts heat better than any other. Oak, very dense, conducts nearly as well; but iron-wood, density 1.426, is very low in conducting power. Air saturated with watery vapor has its conducting power increased nearly in a triple ratio—an explanation of the fact that damp air most rapidly robs the body of its heat, and hence feels more cold than dry air. As a partial illustration of the relative conducting powers of bodies in different states, it may be mentioned that a metal burns the hand at 120°, while contact with a liquid, without motion, may not scald at 150°; and an atmosphere of 300° has been endured for some minutes without injury. The crust of the earth is a poor conductor, first, because mainly composed of oxides, and secondly, because formed in porous and heterogeneous strata. Hence it is that, in temperate latitudes, freezing can never extend during the cold months to any great depth. Applications of poor conductors for the prevention of the escape of heat from bodies, or its entrance into those designed, to be kept cold, are upon the same principle, and very numerous. We term poor conductors warm, because they retain the heat of the body, not because they have heat to impart. Unrivalled in this respect are the down of the eider duck and the finer white furs of the polar regions. We thus find the philosophy of clothing in relation to temperature, and the order of value in view of warmth, viz.: furs, wool, cotton, silk, linen;

also, in part, of fire-proof safes; and wholly, of the lining of furnaces with fire brick, to keep in heat and intensify combustion; of the wrapping of ice in flannel or burying it in sawdust in summer; of the protecting influence of a coat of snow on vegetation; of the preservation of fire by burying it in ashes; of the construction of ice-houses with double walls, filled between with porous material, as sawdust or straw; and so on.—As already intimated, when in liquids and gases heat is applied at a point, the heated parts by rapid expansion become lighter than those about them, rise, and are as constantly replaced by those more cold and dense; so that a circulation of currents of heated fluid upward and colder fluid downward is maintained, until, if that be possible, the whole mass is brought to a common temperature. Hence it is seen why heat should in such cases be applied below; and also why any thing rendering a liquid viscid, as starch, impedes boiling. Oceanic and aerial currents (winds), the warming of buildings by circulation of hot water, the draft of fires and furnaces, and ventilation, are illustrations.—Radiation of heat occurs from the surfaces of all masses in a warmer state than those about them, however low their actual temperature. The most valuable observations we possess on this subject are due to Sir John Leslie (1804). He proved that the radiating power of a body, and hence its rate of cooling, are more influenced by the state of its surface than by the nature of its substance. Water which was 156 minutes in cooling through a certain range while in a bright tin globe, cooled to the same extent in 81 minutes when the globe was thinly coated with lampblack. The nature of surface being the same, the intensity of radiant heat is proportional to that of its source; inversely as the square of distance from the point of radiation; and greater as the direction of impingence on the receiving surface approaches the perpendicular. Indeed, it is now considered that all bodies, however cold, must radiate heat upon all sides of them, so that there is a perpetual interchange of heat rays, and the temperature of any body at any given time is that due to the difference between the amount of heat it imparts and the amount it receives within the same time; while, by necessity, the tendency of all bodies and spaces is thus to an equilibrium of temperature, which only fresh sources of heat excitation continually disturb. Thus is explained the apparent radiation of cold; a globe of ice in the focus of a concave mirror causes a fall of the mercury in a thermometer in the focus of an opposite one, because the substance of the thermometer yields more rays to the ice than it receives from it. Hence, too, the peculiar oppressiveness of those days on which the thermometer indicates a temperature nearly or quite that of the blood; the human body then receives heat nearly or quite as fast, so far as radiation is concerned, as it parts with it, and hence cannot so well rid itself of that surplus naturally produced by its own

processes. Thus, the degrees of heat with which we are familiar may be compared to the middle links in an endless chain, of neither extremity of which we can have any knowledge. Yet, reasoning from the relation of the elasticity of gases to their temperature, it has been conjectured by Joule that an absolute zero of heat (absolute cold) must exist at 491° below the freezing point of water, *i. e.*, -459° F. The greatest cold ever actually produced is -220° ; and according to calculations of Fourier, the temperature of the interplanetary spaces is not lower than from -58° to -76° ; so that an immense period must elapse before the effect of radiation of the earth's heat could become sensible. The heat rays falling upon any body are disposed of in one of 3 ways: they pass through it as a medium (see DIATHERMANCY); or they enter into its substance and are there arrested, usually producing rise of temperature, an effect known as absorption of the heat; or they are thrown off or reflected from its surface. Almost all surfaces reflect a portion of the heat falling upon them, usually more than 10, never more than 97 per cent. The reflecting power is increased by polish, and in some bodies, as glass, by increase of the angle of incidence. Radiation, on the other hand, is favored by roughness and by darkness of color; and leaving out the amount of rays that in some media are transmitted, this singular relation holds between the 3 processes now treated of, namely, that the power of absorbing incident heat is always and for every substance exactly equal to the radiating power of the same; and that the percentage of incident heat not absorbed by a substance equals that which will be reflected from its surface. The table originally obtained by Leslie has been corrected by the later experiments of Provostaye and Desains, according to which, of a given intensity of heat falling on the bodies to be named, the following percentage will be absorbed: by a smoke-blackened surface, or by carbonate of lead, 100; writing paper, 98; glass, 90; gum lac, 72; silver foil on glass, 27; cast iron, 25; mercury, 23; steel, 17; tin, 14; metallic mirrors, 14; brass, 7; copper, 7; gold plating, 5; silver, 3. All the metallic surfaces were partially or highly polished. The emission or radiation is always in the same proportion as that given; and the proportion reflected is found by subtracting the numbers above from 100. In respect of color, black absorbs and radiates most perfectly; then, in order, violet, indigo, blue, green, red, yellow, white. The applications of these principles are numerous and important. Liquids are kept hot longest in light-colored vessels, as those of silver, and polished; they cool most rapidly in those that are black and roughened. For boiling quickly, in culinary arrangements, the latter surfaces are preferable; and the deposit of soot upon the bottoms of kettles further improves them for this purpose. Stoves and pipes designed to keep their heat, or to convey it to distant rooms, there to be given out, require

a low radiating capacity; in the rooms in which the heat is to be dispensed, a higher one, so that here they are impaired by polishing. For persons of feeble heat-regulating capacity, black clothing is the most unfavorable for all seasons; since it absorbs largely in a warm atmosphere, and radiates rapidly in a cold one. III. The heat indicated by the thermometer, that is, the sensible heat in any mass, is not a true measure of the actual amount of heat which the body may contain, and be capable of restoring. Suppose equal measures of water at 108° and at 32° mixed rapidly; the temperature of the whole will then be an average, or 70° —the 38° lost by the one measure being capable of heating the other through exactly the same range. Now suppose equal measures of mercury at 130° and water at 70° mixed as before; the thermometer will now indicate in the mixture only 90° . The 40° which the mercury loses is capable of raising a like weight of water through only about 20° ; and when, instead of equal measures, equal weights of the two are taken, it is found that a loss of about 33° in the mercury only suffices to raise the temperature of the water 1° . These results we express by saying that the capacity for heat of different bodies is different; that, volume for volume, water requires about twice as much actual heat to raise it through 1° of sensible temperature as does mercury, while, weight for weight, its capacity is 33 times as great; or that the heat which shows as 33° in mercury, shows as only 1° in water. The relative capacity for heat of any given substance is termed its specific heat; and since there must evidently be some standard for the comparison, water is assumed as such standard, its specific heat being called 1 or 1,000; and the thermal unit, or unit of actual heat, is then so much heat as will raise the sensible temperature of 1 lb. of pure water from 32° to 33° , or through 1° . The methods of ascertaining the specific heat of bodies are various; as, by mixture; by finding the quantities of ice different bodies will melt in cooling through so many degrees; by finding the different rates of cooling under like conditions, &c. (see CALORIMETER); and though the problem is beset by practical difficulties, yet many satisfactory and instructive results have been obtained. The results are generally given for equal weights; and the following are the specific heats of the bodies named: water, 1,000; ice, 513; alcohol, 615; ether, 503; oil of turpentine, 414; charcoal, 241; sulphur, 203; glass, 198; iron, 114; zinc, 95.5; copper, 95.15; silver, 57; tin, 56; gold, 32.44; lead, 31.4; platinum, 32; mercury, 33; bromine, liquid, 107; among gases: air, 266; oxygen, 195; hydrogen, 3293; steam, 847; carbonic acid, 221; olefiant gas, 420. That is to say, oil of turpentine boils with less than half the heat actually received that would be required by water, provided their boiling points were the same; or more correctly, to heat the oil through 10° requires only about $\frac{2}{3}$ the actual consumption of heat required by water in heat-

ing through the same range; again, the same heat which raises a pound of water 1° , will raise a pound of ice about 2° , a pound of silver about 20° , and so on. Ice and steam have each a less capacity for heat than has water; so that the specific heat changes with change of state. Water has a capacity for heat exceeding that of any other solid or liquid; and as a consequence, the development of a certain sensible temperature in it requires a greater consumption of heat, and hence of fuel, than any other—a conclusion of some moment, when we reflect how vast are the quantities of this liquid that, in cookery and in the arts, must continually be heated or brought to the boiling state. Again, in cooling through a given number of degrees, the same weight of water gives out heat which, entering the air and solids, is equivalent to and produces in them a considerably greater sensible heat than that lost by the water. Thus, in one way, the oceans, lakes, and rivers of the earth become a vast system for equalizing the temperature of the seasons; these bodies of water causing in effect a disappearance of large amounts of the solar heat of summer, and giving this out again to temper the colder air of winter. Thus all latitudes are made more inhabitable; solar heat, drunk in under the equator, is by ocean currents given out all the way to the poles; and the vicinity of large bodies of water, other things being equal, secures a more equal climate, especially a milder winter. Other laws are: 1, that the capacity for heat increases by rarefaction—a result especially manifest in gases, furnishing one reason for the increasing cold of increased elevations above the sea level, as well as for the coldness of the expanding jet of steam escaping under pressure from an orifice in a steam boiler, and a principle now turned to account in the mechanical manufacture of ice; and 2, that this capacity for heat is lessened by compression, a fact long illustrated by the firing of phosphorus by condensation of air in the fire syringe. IV. Heat disappears during changes of bodies from the solid to the liquid, and from the latter to the æriform state; and it reappears from the occurrence of the reverse changes. If pounded ice be taken below freezing point, a thermometer in it marking the true temperature, say 26° , and if heat be then gradually applied, the mercury rises steadily to 32° ; at this point the ice begins to melt, and the mercury remains stationary, until the whole is liquefied. If more heat be added, the mercury again rises until boiling commences, then marking 212° ; but it now again remains stationary until the whole is vaporized; when, if the vapor be confined, its temperature may be increased, and the mercury again rises accordingly. It is easily proved that, at both these stationary points of the mercury, heat has disappeared in the substance changing its state. To illustrate in the former case only: if 1 lb. of water at 32° be rapidly mingled with 1 lb. at 174.65° , the resulting temperature will be the average, 103.32° ; but if 1 lb. of finely crushed

ice at exactly 32° be thus mixed with 1 lb. of water at 174.65° , the ice will rapidly and completely melt, and the liquid mass will, if tested at once, show a temperature of only 32° . The 142.65° of heat lost by 1 lb. of water has disappeared in the act of converting into water 1 lb. of ice. The heat thus disappearing is called latent heat of fusion, which, it would thus appear, for water is 143.65° . The heat which becomes latent in evaporating a pound of water is variously estimated, but is probably about that required to raise, by the re-condensation of the steam thus obtained, 10 lbs. of water through 96.5° , equivalent to a latent heat of 965° . According to the recent views of the relation of heat to other forms of force, the latent heat of fusion is consumed in the work of modifying the cohesion of the particles of a body, so that they lose their character of fixity; that of evaporation, in generating a repulsive energy which results in the gaseous condition. (For many points in connection with changes of state of bodies, see **BOILING POINT**, **EVAPORATION**, and **FUSIBILITY**.) It now appears why changes in the state of bodies must ever be gradual. Time is required, in the case of fusion or evaporation, to furnish the large amounts of heat needful to effect the conversion of form of the body. But when a vapor undergoes condensation, or a liquid solidifies, the same amounts of heat before taken up must reappear in the sensible form, thus for the time raising the temperature of the mass by their liberation; and the vapor cannot liquefy, nor the liquid congeal, until time has been allowed for this extricated heat to be distributed to other bodies by conduction or radiation. The downward changes must therefore also be gradual; and either set must be expedited or retarded by the conditions surrounding the mass undergoing the change. Large bodies of snow and ice are always very long in melting, owing to their reflecting a large share of the radiant heat striking them, and to the imperfect conducting power of the air. Any mass will melt or vaporize rapidly in proportion as it is environed with highly absorbing and conducting materials; and a mass will be allowed to condense into liquid or to congeal rapidly under precisely the same conditions. Again, it is evident that the process of melting or thawing is secondarily, that is, for all bodies in its neighborhood, a process of cooling or freezing; since in order to effect its fluidification the melting body must rob those around it of heat. Hence the peculiar chilling influence of a day when thawing of snow is taking place, with the temperature only a degree or a few degrees above 32° ; and the cold experienced in the feet by walking through melting snow. The cooling down of the emitted heat of a stove or fire by the heating of water, due to loss in specific heat, and by the boiling of water, due to latent heat, are effects very sensibly felt and well known. On the other hand, the congelation or condensation from vapor of a mass is secondarily a thawing or warming process; the heat given out by

the condensing or congealing mass warms the bodies around it. It is thus that the air is tempered during the accession of freezing, and that, as an almost invariable rule, the thermometer rises at the beginning of or during a snow storm, at which time heat is escaping from great quantities of moisture undergoing congelation into snow. It is thus also that a vessel of water in a cellar in which the freezing point is reached or barely passed, owing to the more ready freezing of water in mass than when enclosed in the tissues of vegetable or animal substances, serves, so long as its congelation can go on rapidly, to protect the latter; and that steam condensing in an appropriate set of tubes at a distance from a boiler serves to give out a large amount of heat, and a heat that is free from almost all the inconveniences and deleterious effects possible from other warming processes. Further illustrations of cold produced by evaporation are found in the use of alcohol, ether, or other volatile liquids, or even water, over inflamed parts of the body, for the purpose of lowering their temperature, a result which is thus effectually secured; in the cooling effect on the air of evaporation from the surface of the earth after rain; in the ill effects of wet or damp clothing, especially in a wind, which occasions rapid abstraction of the heat of the body; and in the various familiar processes of freezing by evaporation. On this principle, also, the most intense cold known has been produced. Into a powerful cylinder, in Thilorier's apparatus, carbonic acid is condensed under a pressure of 50 or more atmospheres, and its sensible heat abstracted by a surrounding freezing mixture. The gas is thus liquefied; and if a jet be now opened, and the liquid escaping be directed into a strong metallic flask, its immense expansive force causes considerable volumes of it to burst again into the gaseous form, necessarily abstracting enormous quantities of heat from the remainder, and freezing it into a flocculent snow, temperature -94° , which is then quite permanent in the atmosphere, in an ordinarily poorly conducting vessel. With a mixture of this solid and ether, and by aid of their rapid evaporation in the vacuum of an air pump, Faraday obtained a cold of -166° ; while, by means of a similar bath of protoxide of nitrogen and bisulphuret of carbon, previously liquefied by cold and pressure, Natterer obtained a cold of -220° . The latent heat of fusion of several familiar substances is as follows: water, 142.65° ; nitrate of silver, 113.34° ; zinc, 50.63° ; silver, 37.92° ; tin, 25.65° ; sulphur, 16.85° ; lead, 9.65° ; phosphorus, 9° ; mercury, 5.11° ; beeswax, yellow, 78° . The latent heat of certain vapors is as follows: vapor of water, 965° ; carburetted nitrogen, 108° ; absolute alcohol, 374.4° ; ether, sulphuric, 162.8° ; oil of turpentine, 124° ; bisulphuret of carbon, 152° . (See also **DISTILLATION**.) V. **MECHANICAL THEORY OF HEAT; CONVERTIBILITY OF FORCES; CONSERVATION OF FORCE**. Certain questions respecting the relations and final expression of

forces have lately grown into great importance. Galileo, Bacon, and others of their time held that heat was a motion of the particles of bodies. This idea, in opposition to the notion of phlogiston, or heat-substance, which was in his day gaining ground, Count Rumford revived in 1778. He found that the friction of a steel borer, used in boring cannon, and turned 32 times per minute under a pressure of 10,000 lbs. to the square inch, evolved heat enough in 2½ hours to raise to boiling temperature 18½ lbs. of water; and he thence calculated a rise of 1° F. in 1 lb. of water as the result of a mechanical force estimated at 1,034 lbs. Davy in 1799 melted pieces of ice *in vacuo* by their mutual friction. The production of fire by the rubbing together of dry sticks, Black considered to be an effect of compression, evolving their latent heat; but the fact that, without sensible increase of compression or wear by friction, indefinite quantities of heat may thus be obtained, is at once fatal to this explanation. Carnot in 1824 took the next step, in establishing the suggestive law that the greatest possible work of a heat engine is related to the amount of change of temperature undergone, during the action of such engine, by the enclosed elastic body. In 1842 J. R. Mayer of Heilbronn, and J. P. Joule of Manchester, England, independently of each other, subjected the question to careful experiment, by observing the heat evolved in agitated liquids, and by the compression of gases and friction of solids. The corrected results attained by Joule give a rise of 1° F. in 1 lb. of water as the equivalent of mechanical force exerted, sufficient to elevate against gravity to the distance of 1 foot a weight of 772 lbs. That is, this quantity of force, expressed as 772 foot pounds, is to be regarded as the mechanical equivalent of 1° of temperature. It has accordingly been termed the thermodynamic unit, and is also now well known as Joule's equivalent. Heat and motive power, then, are mutually convertible; heat requires for its production, and produces by its disappearance, mechanical work to the amount already named. This view, the dynamical or mechanical theory of heat, in the hands of its author, of Prof. W. Thomson, Waterston, Rankine, Regnault, and others, has already led to many important deductions, theoretical and practical. Some of these will here be named; for others, see STEAM ENGINE; also the volumes of the "Philosophical Magazine" from the date of Joule's discovery, the "Philosophical Transactions," 1854, and *Comptes rendus*, 1853. The development of heat by compression of gases, by chemical union, and by transmission of the electric current along insufficient conductors, was very naturally considered in the next place; and in these conversions, also, an equivalency between the disappearing and the new-appearing forces has been gradually made out. The instances continually extend and multiply. For example, heat is found to appear when light is extinguished in bodies. Galvani and his followers

had before discovered the development of electricity as a consequence of chemical decompositions; Oersted, in 1820, the production of magnetism in the vicinity of electrical currents; and Faraday, in 1831, the converse phenomenon of development of electricity by magnetism. Faraday proved, in particular, the exact equivalency between the quantity of electricity generated in any cell of a battery, and the amount of chemical decomposition in which it had its origin; and that, in an outside or decomposing cell, compounds were electrolyzed in exact chemical equivalents with the change going on in any single one of the generating cells. Almost all the other forms of force may directly originate motion; and the latter may be made to evolve many of them in return. Within a single galvanic circuit a few feet in length, by suitably arranging the conditions at as many breaks in the conducting wire, almost all the known forms of force, beginning with some disappearing affinity and a generated current, can be successively brought into manifestation; even the growth of vegetables, or nutrition, and muscular or nervous actions of animal bodies, it is now ascertained, may form links in this wonderful chain of the relations of forces. The cases of this nature known at that time were in 1845 generalized by Prof. Grove, in relation to physical forces, in the hypothesis that these forces are mutually convertible and equivalent; or, that any one of them is capable, under suitable conditions, *i. e.*, in connection with its proper material substratum, of giving place to the manifestation, in an equivalent amount, of any other. This relation, expressed by Grove as the "correlation of forces," Helmholtz has named the "conservation," and Smee the "monogenesis of force." In truth, it is hard to understand correlation as anything less than convertibility, or convertibility as aught else than unity—at least, a potential unity, giving certain invariable manifestations or forms of power under any given set of material conditions. In 1848 Prof. W. B. Carpenter first distinctly proposed the extension of this theory to embrace a convertibility of electricity and the nerve force in animals; and in 1850, to the idea of a like inter-relation of the vital with the physical forces generally. The supposed law may, in its present form, be thus broadly stated: all forms of force or energy are convertible; and an apparent disappearance of any one is necessarily compensated by the appearance anew of an equivalent amount of one or more other forms. Some recent confirmations of the law may be named. Foucault caused a soft iron wheel between the poles of an electro-magnet to revolve; as soon as, by passing the galvanic current, magnetism was induced, the wheel was seized as if by an invisible hand, and a considerably increased power was required to keep up its velocity, while heat was rapidly developed in the wheel, and by suitable communication was made to boil water. Prof. W. Thomson finds that the freezing or melting point of bodies

is lowered by pressure, that of water by 0.232° for a pressure equal to 16.8 atmospheres. Faraday has shown that the disrupted affinity of a single drop of water evolves a quantity of electricity sufficient for a flash of lightning; the heat and terrific mechanical effects to which the latter gives rise are but too well known. Bunsen and Roscoe (1857) have experimentally proved that the chemical rays of the sunbeam are extinguished (absorbed) in doing chemical work; and Niepce de St. Victor claims to have preserved, in white card paper saturated with tartaric acid or salts of uranium, exposed for some minutes to the sun and then sealed up, this actinic energy of solar light, and to have obtained its effect after intervals of various length, some as great as 6 months. (See also ANIMAL ELECTRICITY, and FLUORESCENCE.) Of special interest, as touching this subject, are the recent experiments showing that time is an essential element in all phenomena involving movement or change; not less in sensation, perception, volition, and muscular contraction, than in purely physical actions. Thus, the average speed of the nervous change conveying the *matériel* of sensations or volitions in man, is by Helmholtz stated at 180 feet per second; slower in some of the lower animals; faster in some of the temperaments, in man, than in others, and also during elevation of the bodily temperature; but such that, as a rule, in the human species, the whole interval between the reception of an impression from without, and the earliest possible consequent muscular movement, is about 0.2 of a second. Thus the distinctions of quick and slow thinking seem in a fair way of a physical explanation; a conclusion further established by the determinations recently made, for astronomical purposes, of the "personal equation" of observers, or the organic differences in the celerity of sight and registration by hand distinguishing different individuals. According to the views now stated, the food of any animal body, that of man included, is merely a vehicle for the introduction within the grasp of the living organism of physical and chemical energies inwrought into and thus stored up in such pabulum during the process of its formation, and by it obtained, of course, from the forces of inanimate nature; and the necessity and value of food is explained by its capability, at some time subsequent to its ingestion, of suffering a disappearance of the affinities that had constituted it an organizable or highly organic substance, with an equivalent evolution of the forces peculiar to the animal organization. Thus food serves as the physical link between the mind and the world of matter on which the former is enabled to act, and furnishes, not the principle of intelligence, but that sum of energies which we term vital forces, and whose manifestation is the physical fact of life. Thus man moves within an ocean of forces, which he daily draws into his own vitality, and again expends in manifestations necessitated by the continuance of life or dictated by his intelligence. The

work of generating *de novo* organic compounds, including foods, or the vehicles for introducing physical forces into the living animal body, is well known to occur in the green leaves of growing plants; so that at this very point the temporary transfer of energies from the physical to the vital realm must take place. And accordingly it is not only true that at this point simply chemical affinities, as those constituting the compounds carbonic acid, water, and ammonia, give way, to be replaced by organic chemical affinities, as those constituting starch, glucose, and albumen, but there is also a disappearance of certain energies of the sunbeam impinging on the leaves—for instance, most of its actinic and thermal, and a portion of its luminous rays. The fact that green paper or a green wall, of color identical with that of the leaf, produces the same obvious effect in extinguishing certain portions of the sunbeam, does not invalidate this view; for it is only necessary to assume that in the paper or wall, where no organic compounds are forming, some other equivalent manifestation of the disappearing forces—probably heat, fading (a chemical change), or electricity—must occur; and the objector must show, therefore, that between the results in the plant and the paper there is no such difference. If not through the conversion here supposed in the leaves, it is difficult to understand from what source is derived that vast accumulation of energies which are as complete in every part of a tree or of a forest as they were originally in the single acorn from which the latter may have sprung. A question naturally growing out of the view of forces now explained, is that as to what single form of energy, beneath and subject to Creative Intelligence, can more than any other claim to be the fountain or source of the various forms. Loose, analogical reasoning has repeatedly named electricity as the parent force; and Æpinus, conceiving matter to be self-repellent, and gravitation an electrical phenomenon—a sort of residual excess of the attraction of matter and electricity combined, over the repulsion due to the former alone—comes also to this conclusion. But, in view of the important part played by gravitation as a cosmical agency, especially if we accept Laplace's nebular hypothesis, it would seem more reasonable, with Smee and some others, to assign to gravitation this position. Faraday, indeed, has recently questioned whether the variation of gravitative force in the ratio of the inverse square of distance be compatible with the law of conservation of force; whether, if a body were at a distance 10 from the earth, and then suddenly brought within a distance 1, there would not, according to present views of gravitation, occur an actual creation of force, in the ratio of 100 to 1, and a corresponding annihilation on its being as suddenly returned. To this query, Sir W. J. M. Rankine (April, 1859) replies that the quantity conserved during all the mutual actions of a system of bodies, is always equivalent to a product of two factors;

one, a tendency, or impulsion; the other, the distance through which this impulsion is capable of acting, within the time considered. Hence, since in the case of the gravitative attraction of two bodies, which is a mere pressure or phenomenon of statics, the impulsion only is regarded, the quantity of the impulsion is one to which no law of conservation can apply; and consequently the case supposed furnishes no contradiction of the principle at issue. He further remarks that the idea of force, as popularly understood, is mechanically incomplete, in that it may stand for an attraction only; while the conception of energy, properly defined, includes both the factors, and denotes a quantity rigidly and always conserved or replaced by equivalents, in the physical changes thus far studied; so that a better expression for the law would be that of the "conservation of energy." Faraday seems to have overlooked the fact that, to move the supposed body from the distance 10 to the distance 1, would require the expending on its inertia of a power that, thrown into the lighter scale, must neutralize the apparent disparity between the attractions at the two unlike distances; so that his difficulty arises from the supposing of a mechanically impossible case.—The most important general consequence of the theory now detailed, is that expressed in the idea of conservation. According to this, every form of energy, upon ceasing to be manifestly active, simply passes into some other form of energy, of which the manifestation may or may not be equally obvious. Hence, no amount or fraction of force can ever be lost or annihilated; and of course, in a universal system, once complete, no quantity of new force can by any means be created. Physicists have long rested in the conclusion that no atom of matter can be added or lost, except through the direct exercise of creative power; and it is strange that the like obvious conclusion in respect to force or energy comes so late in the history of science. The sum total of energies in a universal system is a constant through infinite time; but particular amounts of energy, according to conditions, may pass from one form into another: speedily, as in the conversion of current electricity into heat or mechanical effect; or slowly, and to appearance irrecoverably; or such energy may appear to pass from within the bounds of one partial system to those of another, as in the case of the earth affected by light and heat of the most remote stars. Among practical results of the theory, are such as the calculation of the mechanical energy extricable from a pound of coal; this is, in the different kinds of coal, according to purity, from 5,000,000 to 10,000,000 foot pounds. A horse or a man can turn to account from $\frac{1}{4}$ to $\frac{1}{5}$ of the mechanical equivalent of the entire daily oxidation of food and tissue; the steam engine, by a much less costly fuel, can be made to yield a larger percentage of work. Prof. W. Thomson calculates the mechanical energy of a cubic mile of sun-

light; and he also finds that the force of the solar rays falling annually on a square foot of land, in lat. 50° , is equal to 530,000,000 foot pounds, about .01 of which he supposes to be consumed in vegetable growth and secretion. He finds that the heat alone hourly given out by each square yard of the solar surface is equivalent to 63,000 horse power, and would require the hourly combustion of 13,500 lbs. of coal. This estimate, however, which is on the supposition that the evolved energy is obtained from chemical action, requires the consumption during each year of 3,000 times the quantity of matter that, if supposed to act by friction and concussion, as in a meteoric shower, must produce the same result. Under the latter supposition, the angular diameter of the sun, as seen from the earth, would be 100,000 years in increasing by a single second of a degree. To such an action, therefore, the materials for which may in part, perhaps, be found in the zodiacal light, Waterston and Thomson ascribe the origin of the sun's energy. By either theory the sun is losing heat, and the materials for its production are being consumed. Motion and heat seem thus to be gradually passing into other forms of force; and if so, the universe is tending to a state of eternal quiescence. It is doubtful whether these deductions will be found accordant with facts known and yet to be discovered. If true, the progress of science may nevertheless enable man for a time to reconvert, upon his own planet, certain forms of force on a large scale into motion and heat, and thus to delay the threatened catastrophe. "It is impossible," said Prof. Owen before the British association in 1858, "to foresee the extent to which chemistry may ultimately, in the production of things needful, supersede the present vital agencies of nature, and enable us to obtain in a small manufactory, and in a few days, effects which can be realized from present natural agencies only when they are exerted upon vast areas of land, and through considerable periods of time."—The sources of heat may, for convenience, be divided into: 1, mechanical, as in the case of arrested motions, in blows, friction, &c., and the evolution of specific and latent heat by compression; 2, physical, as that obtained by direct and simple conversion of electricity, or other physical forces; 3, chemical, as that due to oxidation and like changes (see COMBUSTION, and FUEL); 4, physiological, or that developed during the vital processes of vegetable and animal bodies—unless, indeed, this division is to be included under the preceding; 5, cosmical, as that due to the radiation of suns, by far the larger part of that by which we are affected coming from the centre of our own system, and also that probably radiating from cooling planetary bodies. Doubtless, these distinctions do not hold in nature; heat from all sources is essentially identical, and it may be regarded as interchangeable with all other forms of force. The term caloric, however, if still retained in science, can no longer, as formerly,

be employed to signify a sort of substance of heat. It may appropriately be used to name that form of energy, considered as a cause, of which warmth and the other known results are the sensible effects. In reference to the question as to whether the process of combustion is retarded by the action of sunlight, it may be remarked that the recent experiments of Prof. Le Conte, and his conclusion that sunlight exercises no retarding influence on the burning of bodies, are probably vitiated by his employment of a glass lens to condense the solar beam. Prof. Stokes found that glass cuts off a large portion of the chemical rays; so that when in experimenting he desired to retain these in the transmitted beam, he was obliged to have recourse to prisms and lenses of quartz. Now, concentration of mere solar heat, as of any heat, must have aided the combustion; it is yet a question whether the luminous rays, *per se*, have any effect on the burning process; but the probability having been that the chemical rays, and these only, would by their deoxidizing agency interfere with the combustion, Prof. Le Conte should have avoided the use of a medium that, by excluding the greater part of these rays, must leave the question of their influence on burning doubtful as before, or rather incline us still to accept the popular opinion on the subject.

HEATH (*Erica*, Linn.), the common name of one of the most extensive genera of plants, remarkable for the beauty and variety of its flowers. It is unknown to North America, although there are many flowering plants embraced in the natural order (*Ericaceæ*) to which it belongs, which are widely distributed throughout the new world. In Great Britain the heath or heather covers vast tracts of wild land; on the sides of mountains in Scotland and Ireland it forms beds, extending for many miles together, of trailing stems which are 3 or 4 feet in length. In those portions of the country the plant enters into the manufacture of a variety of rude domestic articles. A double-flowered variety of extreme beauty has been known in British gardens. Some species are peculiar to the north of Europe, and a few to the Mediterranean coasts. In Germany and on the mountains of middle Europe generally the flesh-colored heath (*E. carnea*) is one of the few plants which are the early harbingers of spring. A great many species of the heath are favorite plants for greenhouse culture. These claim the Cape of Good Hope as their native country. In a wild condition there, their external forms and habits are so unprepossessing that they are scarcely noticed among the wild flowering plants; but under cultivation and training they acquire great perfection, one of their principal charms consisting in the production of flowers during the whole year. A very peculiar treatment, however, alone insures success; and owing to general neglect or to ignorance of this fact, the heaths have often fallen into disrepute. The best practical treatise on their artificial growth is McNab's

"Propagation, Cultivation, and General Treatment of Cape Heaths" (Edinburgh, 1832). The soil which Mr. McNab recommends is a black peat, taken from a dry heath or common which is never overflowed with water. With this a certain proportion of sand is used, when not naturally present. Small fragments of freestone are mingled with the compost, it being found that the smaller and more delicate fibres of the roots seek such substances for moisture. On every new change into larger pots, when it becomes necessary, the original ball of earth is raised a little above the rim of the pot, sufficient space being allowed between it and the pot to allow proper watering. Considerable drainage is recommended, and also plunging the pots in tan or some substance which will keep them cool during the heat of summer, and will secure an equal moisture to those portions of the roots which seek the sides. By such a treatment the heaths can be made very remarkable. Some specimens, according to London, have been known to grow 7 or 8 feet high, and to range from 10 to 26 feet in circumference. All the species do well, because, being natives of the higher regions, they can bear considerable cold. A more uniform climate than ours seems most favorable, however, and in England their cultivation has been carried to a greater degree of perfection. The flowers of the heaths have a 4-leaved calyx, a 4-toothed corolla, and their numerous seeds are contained in a dry, 4 or 8-celled capsule, which opens into valves with the partitions projecting from its middle. Their foliage consists generally of very narrow linear leaves arranged in whorls, and are so similar as often to convey the impression that they belong to one species, an idea soon dissipated on the appearance of their wonderfully diversified flowers. It is impossible for words to do justice to the delicacy, elegance, and loveliness of their tissue, colors, and forms. The total number of kinds, according to Don, is from 300 to 400.

HEATH, WILLIAM, a major-general in the American revolution, born in Roxbury, Mass., March 7, 1737, died there, Jan. 24, 1814. When the Massachusetts congress in 1774 voted to enroll 12,000 minute men, volunteers from among the militia, Heath, then a farmer in Roxbury, was commissioned as one of the generals. On June 22, 1775, he received the appointment of brigadier in the continental army, and in Aug. 1776, was created major-general. When the troops moved to New York, Heath was stationed in the highlands near King's Bridge, with orders to throw up fortifications for the defence of that important pass. In 1777 he was transferred to Boston, and the prisoners of Saratoga were intrusted to him. In June, 1779, he was again in New York, at the highlands, with 4 regiments, and he was stationed near the Hudson till the close of the war. He was the last surviving major-general of the war, and his "Memoirs of Maj. Gen. Heath, containing Anecdotes, Details of Skirmishes, Battles, &c., during the American War" (1798), shows him

to have been honest and faithful in the service of his country, with a dash of vanity and simplicity.

HEATHFIELD, LORD. See ELIOTT, GEORGE AUGUSTUS.

HEBBEL, FRIEDRICH, a German lyric and dramatic poet, born in Wesselburen, Holstein, March 18, 1813. He was graduated at Heidelberg, and went to Hamburg, where his "Judith" (1841), "Genoveva" (1843), and "The Diamond" (1847), were completed. He now successively visited Copenhagen, Paris, London, and Naples. In Vienna, he married the actress Christine Enghaus in 1848.

HEBE, in Greek mythology, the goddess of youth and daughter of Jupiter and Juno. Her avocations were various. She served her fellow divinities with nectar at their festivals; assisted her mother in putting the horses to her chariot; and bathed and dressed her brother Mars. She is said to have been married to Hercules after his apotheosis, and to have been the mother of two sons by him.

HEBEL, JOHANN PETER, a German poet, born in Basel, May 11, 1760, died at Schwetzingen, Sept. 22, 1826. He studied at Erlangen, and in 1791 was appointed professor in the gymnasium of Carlsruhe. He became in 1805 church counsellor, in 1819 prelate. His poems, which were principally written in a Swabian sub-dialect which prevails especially in the Rhenish region near Basel, are remarkable for simplicity and yet refinement. Goethe praised them warmly in a review which did much for the fame of the poet. Hebel's principal works are: *Allemannische Gedichte* (Carlsruhe, 8th ed. 1842), of which there are 5 different high German translations; *Die biblischen Geschichten* (Stuttgart, 1824); and *Der rheinländische Hausfreund* (Stuttgart, 1827). A monument was erected to Hebel in Carlsruhe in 1835.

HEBER, REGINALD, an English bishop and author, born in Malpas, Cheshire, April 21, 1783, died in Trichinopoly, presidency of Madras, April 3, 1826. In early childhood he manifested a remarkable fondness for study, and at the age of 7 had translated Phædrus into English verse. Entering Brasenose college, Oxford, in 1800, he took high rank as a classical scholar, and during his first year at the university his *Carmen Seculare*, a hexameter poem commemorating the opening of the century, obtained the prize for Latin verse. In 1803 he produced his prize poem "Palestine," which occupies a prominent place among his poetical remains, and which is still considered the best performance of the kind emanating from the university. After a brilliant academical career, he took his degree of B.A. in 1804, and the next year gained the bachelor's prize for an English prose essay on the "Sense of Honor." Subsequently he made an extensive tour through northern and south-eastern Europe, and in 1807 took orders and was presented by his brother Richard to a living at Hodnet in Shropshire, belonging to the family, on which he settled in

1809, immediately after his marriage with the daughter of Dr. Shipley, dean of St. Asaph. In order to devote himself to his parochial duties, he withdrew in a great measure from the society of the world by which he was courted, and for 14 years labored faithfully among his parishioners, to whom the gentleness of his manners and his benevolence of heart greatly endeared him. He sought out distress and relieved it with almost prodigal liberality, and was never happier than when he could afford consolation at the bedside of the sick and needy. His leisure hours were still devoted to literature, and he became a frequent contributor to the "Quarterly Review," beside cultivating his poetical talent in the composition of hymns, it having long been a favorite project with him to elevate the literary standard of church psalmody. In 1812 appeared a small volume, entitled "Poems and Translations" (12mo., London), containing many original hymns written to particular tunes, his talent for adapting poetry, sacred or secular, to any tune he chanced to hear, being a remarkable characteristic with him. The elegant versification and devotional fervor of these place them among the most popular and beautiful productions of the kind in the language. He also commenced a dictionary of the Bible, which he was compelled by other duties to relinquish, and in 1819-22 edited the works of Jeremy Taylor, with a copious life of the author, and a critical examination of his writings. In 1822 he was appointed preacher at Lincoln's Inn, and in the succeeding year was consecrated bishop of Calcutta, a see which at that time embraced all British India, Ceylon, Mauritius, and Australasia. He departed for Calcutta in June, 1823, and 12 months later entered upon the visitation of his vast diocese. From that time until his death he was incessantly occupied with the duties of his office, making long journeys to Bombay, Madras, and Ceylon, and showing an energy and capacity which, combined with his mildness and benignity, elicited, it is said, the respect and veneration of the native population of India. He died of a fit of apoplexy, while refreshing himself with a cold bath, half an hour after administering the rite of confirmation to a number of native converts. After his death appeared his "Narrative of a Journey through the Upper Provinces of India, from Calcutta to Bombay" (2 vols. 4to., London, 1828), a work abounding in animated descriptions of scenery and manners, and vividly illustrating the Christian zeal and benevolence of the writer. In 1827 his hymns were first published entire in a volume entitled "Hymns written and adapted to the Service of the Church," of which many subsequent editions have appeared. The missionary hymn in this collection, "From Greenland's icy mountains," is familiar to the Protestant church service wherever the English language is spoken, and would alone preserve the author's name from oblivion. The latest edition of his complete poems, including

his "Palestine," is that of 1855 (8vo., London). Among these the translations from Pindar have been greatly admired. The Bampton lectures entitled "The Personality and Office of the Christian Comforter" (8vo., Oxford, 1813), were his only sermons published during his life. Several volumes of his sermons delivered in England and India were posthumously published, and in 1830 appeared the "Life and Unpublished Works of Reginald Heber, by his Widow" (2 vols. 4to., London). His life and character have been several times sketched by able hands; among others by Jeffrey, who describes him as "zealous for his church, and not forgetful of his station, but remembering it more for the duties than for the honors that were attached to it, and infinitely more zealous for the religious improvement and for the happiness and spiritual and worldly good of his fellow creatures of every tongue, faith, and complexion."—RICHARD, half brother of the preceding, and a well known bibliomaniac, born in Westminster in 1773, died in Oct. 1833. He was educated at Brasenose college, Oxford, where he was noted for his assiduous cultivation of the Latin and Greek classics. At 19 years of age he edited the works of Silius Italicus (2 vols. 12mo., 1792), and a year later prepared for the press an edition of the *Claudian Carmina* (2 vols. 12mo., 1793). A taste for book collecting was developed in him in childhood, and in the latter part of his life it became a ruling passion. Succeeding on the death of his father in 1804 to large estates in Yorkshire and Shropshire, which he considerably augmented and improved, he forthwith devoted himself to the purchase of rare books; and having abundant means, he was enabled to amass a stock of books and manuscripts such as is seldom found in the possession of a single individual. After ransacking England he travelled extensively on the continent, purchasing everywhere, and leaving large depots of books in Paris, Antwerp, Brussels, Ghent, and elsewhere in the Netherlands and Germany. His residence in Picnic, London, was filled with books from top to bottom, and he had, beside, another house in York street laden with literary treasures, and a large library in Oxford. At his death his collection in England was estimated by Dr. Dibdin at 105,000 volumes, exclusive of many thousands on the continent, the whole having cost upward of £180,000. Mr. Allibone in his "Dictionary of Authors," however, considers this an underestimate, and states as the result of a careful computation that the volumes in England numbered 113,195, and those in France and Holland 33,362, making a total of 146,527, to which must be added a large collection of pamphlets bound and unbound. This immense library was disposed of at auction after the owner's death, the sale lasting 216 days, and realizing over £60,000. Mr. Heber was an unsuccessful candidate for the representation of the university of Oxford in parliament in 1806, but was returned for it in 1821, and served until 1826.

HÉBERT, JACQUES RENÉ, a French revolutionist, known also under the assumed name of PÈRE DUCHESNE, born in Alençon in 1755, executed in Paris, March 22, 1794. Of low parentage, and still lower education, he repaired when very young to Paris, where he led an obscure life, generally supporting himself by dishonest means. When the revolution broke out, he took to pamphlet writing, and soon established a scurrilous newspaper called *Le Père Duchesne*, which had considerable popularity among the lowest classes of the people, and was instrumental in exciting several insurrectionary movements. After Aug. 10, 1792, he was one of the most active members of the self-constituted revolutionary commune, and received the appointment of substitute to the *procureur syndic*. The Girondists having obtained from the convention an order for his arrest, he was liberated in consequence of a violent outbreak of the citizens, and became more popular than ever. A member of the commission to examine Marie Antoinette, he uttered the most outrageous calumnies against the unfortunate queen. When the Girondists were in their turn arrested, he is said to have plotted their assassination before their trial. In conjunction with Chaumette, Anacharsis Clootz, and others, he established the worship of the "goddess Reason;" and, relying upon the support of the commune and the club of Cordeliers, organized the ultra-revolutionist party which bore his name, the Hébertists or *Enragés*. The committee of public safety, which was controlled by Robespierre, had them arraigned by virtue of a decree of the convention; and on the night of March 13, 1794, Hébert, Chaumette, Montmore, Ronsin, Clootz, and 14 others, were conveyed to prison. Hébert evinced great cowardice on his trial, and was executed amid the jeers of the Parisians. The circulation of his paper had been immense. During the year 1793 he received from the government no less than \$36,000 for copies gratuitously distributed. Beside his journal, he published several pamphlets of a similar character, *Les vitres cassées*, *Catéchisme*, *Cantique séculaire*, *Almanach*, &c., all of them signed "Le Père Duchesne."

HEBREWS, EPISTLE TO THE, one of the canonical books of the New Testament, addressed to converted Jews, and designed to dissuade them from relapsing into Judaism and to fortify them in the Christian faith. It aims to demonstrate the preëminence of Christ over Moses and the angels of the Lord, and of the gospel over the law, and to show that the latter was typical of the former, and was abolished by it. The Greek fathers unanimously ascribed the epistle to Paul, and its Pauline authorship was generally accepted in the western church from the 5th century, though in the first 3 centuries no Latin writer attributed it to him. Luther suggested Apollos as the author, and has been followed by Bertholdt, De Wette, Bleek, and Tholuck. Böhlme and Mynter ascribe it to Silas; others to Clement, Luke, or Barnabas.

HEBREWS, ISRAELITES, OR JEWS (Heb. *Ibrim, Beney Israel, Jehudim*), a people of Semitic race, whose ancestors appear at the very dawn of the history of mankind on the banks of the Euphrates, Jordan, and Nile, and whose fragments are now to be seen, in larger or smaller numbers, in almost all the cities of the globe, from Batavia to New Orleans, from Stockholm to Cape Town. This people, as such, forms one of the most remarkable phenomena in history. When little more numerous than a family, they had their language, customs, and peculiar observances, treated with princes, and in every respect acted as a nation. Though broken as if into atoms and scattered through all climes, among the rudest and the most civilized nations, they have preserved through thousands of years common features, habits, and observances, a common religion, literature, and sacred language. Without any political union, without a common head or centre, they are generally regarded and regard themselves, as a nation. They began as nomads "migrating from nation to nation, from state to state;" their law made them agriculturists for 15 centuries; their exile has transformed them into a mercantile people. They have struggled for their national existence against the Egyptians, Assyrians, Babylonians, Syrians, and Romans; have been conquered and nearly exterminated by each of these powers, and have survived them all. They have been oppressed and persecuted by emperors and republics, sultans and popes, Moors and inquisitors; they were proscribed in Catholic Spain, Protestant Norway, and Greek Muscovy, while their persecutors sang the hymns of their psalmists, revered their books, believed in their prophets, and even persecuted them in the name of their God. They have numbered philosophers among the Greeks of Alexandria and the Saracens of Cordova, have transplanted the wisdom of the East beyond the Pyrénées and the Rhine, and have been treated as pariahs among pagans, Mohammedans, and Christians. They have fought for liberty under Kosciuszko and Blücher, and popular assemblies among the Slavi and Germans still withheld from them the right of living in certain towns, villages, and streets. This phenomenon, however, admits of explanation. At the very beginning they were not merely a family or tribe, but also a sect, a society or community, superior to those surrounding it in culture, morals, and ideals, too powerless to hope for great success over others, but anxious to defend their own moral condition at the price of self-isolation, and to perpetuate it by the development of peculiar customs and religious observances. The father of the people himself, Abraham, is recorded as acting under a divine mission, and leaving the land of his parents and his birth in order to preserve and propagate his ideal in "his children and house." After a hard trial in Egypt and a marvellous deliverance they received a law, at the same time national and religious, which constituted them a

"people of priests" to enlighten the nations by their example, and which by its sublimity inspired them with the natural conviction that they were the chosen people of God, who alone knew him and walked in his ways. The national and religious elements became more and more developed and blended, the antagonism with the surrounding idolatry and religiously instituted immorality more and more striking; a long continued struggle for self-preservation against overwhelming influences changed enthusiasm into fanaticism and self-esteem into repulsive pride, which was repaid by antipathy, hatred, and cruel persecution. Their national independence was destroyed; fanatical attempts to recover it failed; they were scattered among nations who in the meanwhile had reached a civilization in some respects superior to their own; the ancient idolatries were replaced by new religious systems drawn from Hebrew sources; the name of their God was now praised from the rising of the sun to its setting; the ruins of their Zion had become sacred to the nations. But still they clung to their faith, ceremonies, traditions, and hopes; for their religious and national characteristics were so deeply rooted and so well blended that they wonderfully supported each other. They were still convinced of their religious and moral superiority to the Gentiles; they were justified by the cruelties of the world in believing themselves its martyrs; they submitted to them from what they regarded as a divine obligation. Their masters punished their self-sufficiency, humiliating pride, and pretensions by crushing burdens and legal degradation, their religious enemies by calumnies, the people by contemptuous social exclusion; and it was not till the last quarter of the 18th century that a brighter prospect opened by the inauguration of the principle of religious liberty and civil equality in America and afterward in the N. W. of Europe. This all-pervading mixture of the religious and national elements also requires a different treatment of their history from that of all other nations. It must be at once a history of the people, of its religion, and of its literature. Separate from it the religious leaders Moses, Ezra, Hillel, Rabbi Gamaliel, &c., and no national history remains. The prose writings of the Pentateuch, the effusions of Isaiah or Micah, the Psalms, the Lamentations, the Hebrew writings of Maimonides or Mendelssohn, can as little be separated, as merely literary works, from the history of the people, as can the Philippics of Demosthenes from that of Athens, Cicero's orations against Catiline from that of Rome, or the declaration of independence from that of the United States. Having thus stated the character of our subject and the only natural way of treating it, we must also refer the readers of this brief sketch for further details, criticism, and illustrations, to the respective special articles of this work, as well as to the "book of books" itself, which is in the hands of each of them.—The history of the Hebrews begins (about 2000

B. C., according to the generally adopted chronology) with the emigration of the Semite Abraham from Ur of the Chaldees (*Ur Casdine*), a place which has been identified with a fortress of the same name in Mesopotamia mentioned by Ammianus, and by more recent critics (Rawlinson and others) with Hur or Mugheir in the vicinity of Babylon. He was by his father Terah a descendant of Eber, and may as such have borne the name Ibri (Hebrew), but more likely he was first designated by it in the land west of the Euphrates, as an immigrant from beyond (*eber*) the "great river." The name Israelite was applied to his descendants after a surname of Jacob, his grandson, and that of Jehudim (Jews) at a much later period (first mentioned about 712 B. C.), when, after the dispersion of the 10 tribes, the house of Judah became the representative of the whole people. Separating from his relatives, who were idolaters, Abraham passed over from Mesopotamia (Aram Naharain) to Canaan or Palestine (as it was afterward called by the Greeks after the Philistines, who inhabited its S. W. coast), where he lived the life of a nomad, being rich in herds, flocks, and attendants, and worshipping the "Creator of heaven and earth," to whose service, "to walk before him and to be innocent," he bound himself and his house, in after life, by the covenant of circumcision. Having repaired to Egypt during a famine and returned, he rescued his nephew Lot, who lived in the valley of the lower Jordan, from the captivity of Amraphel, a king of Shinar, and his allies; lived for some time in the land of the Philistines; and finally settled near Hebron, where he died, leaving his main inheritance and his faith to Isaac, his son by his relative Sarah. Isaac thus became the second Hebrew patriarch, while his brother Ishmael, the son of Hagar, an Egyptian woman, sought a separate abode in Arabia, where he became the father of a Bedouin tribe. Of the two sons of Isaac, only Jacob (afterward Israel), the favorite of their mother Rebecca, imitated the peaceful and pious life of his fathers and propagated the Hebrew line in Palestine, while his brother Esau (or Edom) settled in the mountainous land of Seir (Idumaea). Jacob had 12 sons, of whom he distinguished Joseph, the child of his favorite wife Rachel. This excited the envy of the others, who secretly sold their brother as a slave to Egypt, where he rose through his wisdom to the dignity of prime minister to one of the Pharaohs. The latter allowed him to bring the whole family of his father, numbering 70 males, over from the land of Canaan, and to settle them in the province of Goshen (E. of the Pelusiac branch of the Nile, it is supposed), where they could continue their pastoral life, unmolested by the Egyptians, who held that mode of existence in great contempt, and where they would be uncontaminated by Egyptian idolatry. Jacob closed his life, which had been shorter and less happy than that of his fathers, after having adopted the two sons of Joseph, Manasseh and Ephraim, for his

own, and blessed all his children. The book of Genesis, the only record of that earliest period of Hebrew history, closing with the death of Jacob and Joseph, also contains the last blessing of the former, a sublime vision in which love and just censure are mingled, and a specimen of the most ancient Hebrew poetry. After the death of Joseph the Hebrews were not only oppressed but degraded to the condition of slaves, were overtaken and employed in the public works, while the fear of their joining a foreign enemy finally led one of their tyrants to decree what may be called their slow extermination, they having in the meanwhile increased to a prodigious number. How long they remained in the "house of slaves" (for the Hebrews were not the only slaves in Egypt) cannot be determined, there being scriptural testimony for 430, as well as for about 210 years; nor can the precise date of their arrival, which Bunsen endeavors to fix almost 1,000 years earlier than it is fixed by scriptural chronology; nor of their exodus, which, according to some of the most celebrated Egyptological critics, Wilkinson, Bunsen, Lepsius, &c., took place in the last quarter of the 14th century B. C., while according to a distinct biblical passage (1 Kings, vi. 1) it must have happened early in the 15th. Nor is it easier or more important to find the reigns during which these events took place. There is no conclusive evidence to identify either Phthahmen, Menephthah, or Rhamses I. or II., with the Pharaoh of the exodus, as various critical defenders of a later date have tried to do. Others have attempted to identify the Hebrews with the Hyksos, which is little less absurd than the fables of Manetho mentioned by Josephus. The last named Jewish historian has also some traditional additions to the early life of Moses, concerning his exploits in Ethiopia, which may still find confirmation in future Egyptological discoveries. Omitting all special criticism, we must confine our narrative here to a brief extract from the sacred and therefore well guarded record of the nation itself; and as there is no other beside it, even criticism can do little more. Born at the time when the oppression of his people had been carried to its extreme, Moses, the younger son of Amram, a descendant of Levi, the 3d son of Jacob, was doomed to perish in the Nile like all new-born males of the Israelites, but was saved by the love of his mother Jochebed and his sister Miriam, and the compassion of a daughter of the Pharaoh. Adopted as a son by the princess, who gave him his name (Egyptian, *mo*, water, and *ynez*, drawn; Hebrew, *mashoh*, to draw) in allusion to her having drawn him out of the water, but nursed by his mother, he united the highest Egyptian education with the feelings of a Hebrew. And "when Moses was grown he went out unto his brethren, and looked on their burdens." Seeing an Egyptian man smiting one of his brethren, he killed him, fled to Midian, married Zipporah, the daughter of Jethro, a wise priest or prince of that country,

by whom he had two sons, and tended the flock of his father-in-law, leading it into the desert, as far as Mount Horeb, the N. E. eminence of Mount Sinai, in the S. part of the Arabian peninsula between the two gulfs of the Red sea. It was not till the decline of his life that he returned to Egypt to become the "shepherd of his people." He appeared with his brother Aaron, his spokesman, assembled the elders of Israel, and announced to them their approaching deliverance and return to Canaan in the name of the Everlasting (Hebrew, *Jehovah*, Being) and Unchangeable (*Ehyeh-asher-chyeh*, I-am-that-I-am), the God of Abraham, Isaac, and Jacob, who "had seen their affliction." He now repaired to the palace of the king, proved superior to his priests, gained the admiration of his ministers and people (Exod. xi. 3), threatened, and finally compelled him to grant his demand by a series of disasters, the last of which was the sudden destruction at midnight of all the first born Egyptians (probably then a mighty aristocracy). The Israelites had received their secret instructions, and immediately departed toward the desert. Moses led them across the northern extremity of the gulf of Akabah or Suez, the western prolongation of the Red sea (Heb. *Yam Soof*, reedy sea); and the king of Egypt, who, repenting of having let them go, pursued them with his cavalry and heavy war chariots, perished there with his army. The "song of Moses," which celebrates this great event (Exod. xv.), is another admirable monument of ancient Hebrew poetry, though surpassed in grandeur by that which closes the narrative of his life (Deut. xxxii.). After having repulsed an attack of the Amalekites, a roving and predatory Arabian tribe, Moses led the people to Mount Sinai, which from the delivery of the ten commandments now received the name of the mountain of God. This divine decalogue not only contained the common fundamental points of every moral and legal code ("Honor thy father and mother," "Thou shalt not murder," &c.), but also included the sublime truth of monotheism, the great social institution of the sabbath, and the lofty moral precept: "Thou shalt not covet." These commandments, which formed the basis of a "covenant between God and Israel," together with the successively promulgated statutes, precepts, &c. (according to the rabbis altogether 365 positive and 248 negative obligations), constitute the Mosaic law (*Torath Mosheh*), which is contained principally in the 2d and 3d, and repeated in the 5th book of the Pentateuch, and which for about 15 centuries remained, and with the exception of a strictly national part still is, the general code of the Hebrews. Its aims are the moral perfection of the individual and the welfare of society. Its means are chiefly a common and central worship, under the direction of the Aaronites (*Cohenim*), whose restrictive obligations are, however, not equalled by the privileges they enjoy; 3 festivals for the commemoration of great national events, thanksgiving and rejoicing, as well as for the

annual gathering of the whole people; a fast day for repentance; periodical readings of the law; general education through the Levites its guardians (Deut. xxxiii. 10); a weekly day of rest (sabbath) for the people and their animals; the 7th year as a periodical time of rest for the earth, as well as for the extinction of various pecuniary claims; numerous and most frequently repeated obligations for the support of the fatherless and widow, the poor and the stranger; an organized judiciary and police; a severe penal code; strict rules for the preservation of health and cleanliness; circumcision as a bodily mark of the covenant; and numerous other rites and ceremonies designed to guard the nationality, or to lead to the preservation of truths and principles (which has been admirably illustrated in Mendelssohn's "Jerusalem"). The spirit of the whole was well defined by Rabbi Hillel in his words to a heathen who desired to be instructed in Judaism in a few minutes: "'Do not, to others what you would not have others do to you' is the essence; every thing else is but comment." The chief principles are: self-sanctification and righteousness, in imitation of God, who is holy and righteous (Lev. xix. 2, &c.); brotherly love and equality, for all people are his children (Deut. xiv. i.); freedom, for all are bound exclusively to his service (Lev. xxv. 55); limited right of property, for the whole land belongs to him (Lev. xxv. 23). The principal promise of reward is the natural share of the individual in the happiness of society; the principal threat of celestial punishment, his natural share in its misfortunes; every mention of reward beyond the grave, which in the time of Moses had long been a chief element in the teachings of Egyptian and other priests, is avoided throughout, probably as promoting selfishness in a rude state of society by referring exclusively to the individual. The form of government is the republican (though a limited monarchy may be established if the people demand it), with the moral theocratic dictatorship of a prophet (*nabi*) like the lawgiver, with the sovereignty of the people who judge the merits and claims of the prophet above it, and above all the majesty of the divine law, which can be explained and developed, but not altered. The whole system is entirely practical, containing no definitions of supernatural things, except in a negative form, no articles of belief, no formulas of prayer. The following extracts from one chapter (Lev. xix.) of the Pentateuch may serve as an illustration of its general character: "Ye shall fear every man his mother and his father, and keep my sabbaths: I am the Lord your God. . . . And when ye reap the harvest of your land, thou shalt not wholly reap the corners of thy field, neither shalt thou gather the gleanings of thy harvest. And thou shalt not glean thy vineyard, neither shalt thou gather every grape of thy vineyard; thou shalt leave them for the poor and the stranger: I am the Lord your God. Ye shall not steal, neither deal falsely, neither

lie one to another. And ye shall not swear by my name falsely, neither shalt thou profane the name of thy God: I am the Lord. Thou shalt not defraud thy neighbor, neither rob him; the wages of him that is hired shall not abide with thee all night until the morning. . . . Ye shall do no unrighteousness in judgment; thou shalt not respect the person of the poor, nor honor the person of the mighty; but in righteousness shalt thou judge thy neighbor. Thou shalt not go up and down as a talebearer among thy people; neither shalt thou stand against the blood of thy neighbor: I am the Lord. Thou shalt not hate thy brother in thy heart; thou shalt in any wise rebuke thy neighbor, and not suffer sin upon him. Thou shalt not avenge, nor bear any grudge against the children of thy people, but thou shalt love thy neighbor as thyself: I am the Lord. . . . Regard not them that have familiar spirits, neither seek after wizards, to be defiled by them: I am the Lord your God. Thou shalt rise up before the hoary head, and honor the face of the old man, and fear thy God: I am the Lord. And if a stranger sojourn with thee in your land, ye shall not vex him. But the stranger that dwelleth with you shall be unto you as one born among you, and thou shalt love him as thyself; for ye were strangers in the land of Egypt: I am the Lord your God. Ye shall do no unrighteousness in judgment, in mete-yard, in weight, or in measure. Just balances, just weights, a just *ephah*, and a just *hin* shall ye have: I am the Lord your God, who brought you out of the land of Egypt. Therefore shall ye observe all my statutes, and all my judgments, and do them: I am the Lord."—But the difficulties of introducing this system of institutions were as immense as those of maintaining the nation in the desert. The first census showed 22 male Levites above one year of age, and 603,550 males of other tribes above 20, including 22,273 first born. Provisions were scanty, water was scarce, dangers were constant; the people were an unruly mass of freed slaves, who often regretfully thought of the flesh pots of Egypt and of the quiet carelessness of bondage; a multitude of non-Israelites who had joined them regretted the visible gods of their former worship; envy and ambition often augmented the existing dissatisfaction. Moses was still on Mount Sinai when the people compelled his brother Aaron to give them, in a golden calf, an imitation of the Egyptian Apis, a visible god. Moses, descending, broke the tablets of the covenant in his anger, and restored order by a massacre of the idolatrous rioters, but almost despaired of his mission and desired to die. A pompous worship was now introduced, and sacrifices ordained, of which a later prophet, Jeremiah (vii. 22), significantly says in the name of God: "For I spake not unto your fathers, nor commanded them in the day that I brought them out of the land of Egypt, concerning burnt offerings or sacrifices." Moses removed his tent from the camp. All difficulties, however, were con-

quered by the "man of God," who consoled himself with the idea that a generation educated under his guidance would replace that of the desert. Having passed round the lands of the Edomites, Moabites, and Ammonites, he conquered those of Sihon, king of the Amorites, and of Og, king of Bashan (Batanæa), E. of the Jordan, giving them to the tribes of Reuben and Gad and to half the tribe of Manasseh, and died on Mount Nebo before entering the land of promise. The man who was "meek above all men that were on the face of the earth" died in voluntary loneliness, and "no man knoweth of his sepulchre unto this day." Joshua, his pupil and appointed successor, an Ephraimite, now led the 13 tribes of Israel, named after 11 sons of Jacob and the 2 sons of Joseph, across the Jordan into Canaan (or Palestine proper), which was conquered after a bloody war of extermination, and allotted to the tribes of Judah, Ephraim, Manasseh (the other half), Benjamin, Simeon, Zebulun, Issachar, Asher, Naphtali, and Dan. The Levites, who were to live by tithes, received no separate division, but a number of cities within the limits of every tribe, among others the historical places of Gibeon, Geba, Beth-Horon, Mahanaim, Hesbon, Jazer, Hebron, Shechem, Golan, Kedesh, and Ramoth-Gilead; of which the last 5 together with Bezer were selected as towns of refuge for involuntary murderers, while Shiloh became the central city, receiving the tabernacle with the ark of the covenant. Phinehas, son of Eleazar, the zealous priest, and Caleb, son of Jephunneh, were among the most distinguished assistants of Joshua. Before his death, Joshua held an assembly of the whole nation at Shechem, in which he called upon them to choose once more between the gods of their ancestors beyond the Euphrates, those of the conquered Amorites, and the God whom he was determined to follow with his house. The people chose their Deliverer and Preserver, and confirmed their choice by a new covenant; but scarcely were the elders gone who had witnessed the whole work of deliverance and maintained the order of Joshua, when idolatry and anarchy became general. Parts of the country remained unconquered, principally in the hands of the Phœnicians in the N. W., of the Philistines in the S. W., and of the Jebusites in the centre. With these, and with other neighbors on the borders, frequent warfare had to be waged, while the young state, forming a loose confederacy of 12 (or, counting Manasseh as two, of 13) almost independent members, had neither natural boundaries nor a capital, neither a hereditary head nor an elective federal government, the only bond of union being the common law, and the only centre the seat of the ark of the covenant, whose guardians probably enjoyed the privilege of convoking a general assembly of the people in cases of urgent necessity. Such national assemblies were often held at Mizpah. But the enmity and frequent attacks of the surrounding idolatrous tribes was less pernicious than their

friendly relations in times of peace, when the voluptuous rites connected with the worship of Ashtoreth and other divinities of the Phœnicians, Syrians, and Philistines, were too seductive for a people in an undeveloped state, whose own religion required a rigid observance of a strict morality. To remedy these evils, heroic and inspired men arose from time to time, repulsed the enemies, restored order and the law, were acknowledged as leaders and judges, at least by a part of the people, and thus revived its unity. This period of republican federalism under judges (*shofetim*, a name which also designated the chief magistrates of the Carthaginians in their language, which was also Semitic) is described in the book of that name, a continuation of that of Joshua, and forms one of the most interesting portions of Hebrew history. But criticism labors in vain to arrange chronologically the striking but in part probably contemporaneous events of the narrative. Othniel, a younger brother or nephew of Caleb, of the tribe of Judah, was the first of the judges. Ehud, a Benjamite, delivered Israel from the oppression of the Moabites, having killed with his own left hand Eglon, the king of the invaders. "And after him was Shamgar, the son of Anath, who slew of the Philistines 600 men with an ox goad," at a time when "no shield was seen or a spear among 40,000 in Israel." Barak, a Naphtalite, inspired by Deborah, a female prophet and judge, who afterward celebrated the event in her great song (Judges v.), gained together with her a signal victory near Mount Tabor and the brook Kishon over the army of Sisera, commander of Jabin, a Canaanite king on the N. of Palestine, which numbered 900 iron war chariots. Sisera fled, but was killed in sleep by Jael, a woman of the nomadic and neutral Kenite tribe, in whose tent he had sought refuge. "The mother of Sisera looked out at a window, and cried through the lattice, Why is his chariot so long in coming? why tarry the wheels of his chariot? Her wise ladies answered her, yea, she returned answer to herself, Have they not sped, have they not divided the prey?" The song closes by comparing the victorious friends of the Lord to the rising sun conquering the night. Gideon, characterized as the youngest son of one of the weakest families in Manasseh, surprised with 300 select men the immense camp of the Midianites and Amalekites, dispersed them, called the surrounding tribes to arms, exterminated the invaders, appeased the Ephraimites, who were jealous of the glory gained by their neighbors, and refused to accept the royal dignity offered him by the gratitude of the people, declaring: "I will not rule over you, neither shall my son rule over you; the Lord shall rule over you." Abimelech, however, his son by a concubine, gained adherents among the idolatrous friends of his mother in Shechem, destroyed the numerous family of his father, was proclaimed king in that city, was afterward expelled, but reconquered the city, and finally

perished while besieging the tower of the neighboring Thebez by a piece of millstone cast from its top by a woman. Jotham, the only son of Jerubbaal (as Gideon was called from his destruction of the Baal worship) who escaped from the massacre of his brothers, had predicted the bloody end of the usurper in his fable of "the trees that went forth to anoint a king over them" (Judges ix.), which is probably the most ancient specimen of that kind of poetry now extant. Of the judges Tola, of the tribe of Issachar, and Jair from Gilead in Manasseh beyond the Jordan, little more is preserved than their names. Jephthah, another Gileadite, of illegitimate birth, having been expelled from his home, was recalled by his native district to combat against the Ammonites, who had attacked it, carried the war into the land of the enemy, and returned after a signal victory, of which his heroic daughter, in consequence of a vow, became a victim, being doomed to die or to live unmarried in loneliness, the obscurity of the narrative rendering this point uncertain. And "the daughters of Israel went yearly to lament the daughter of Jephthah the Gileadite four days in a year." The Ephraimites, who had not been called to participate in the combat, now threatened vengeance on the conqueror, who, unlike Gideon, terminated the quarrel with a bloody defeat of the troublesome tribe, which is the first example of civil war among the Israelites, soon to be followed by others. Ibzan of Bethlehem in Judah, Elon, a Zebulunite, and Abdon, an Ephraimite, are next briefly mentioned as judges. Dan, too, gave Israel a judge in the person of Samson, who braved and humiliated the Philistines; he was a Nazarite of prodigious strength, whose adventurous exploits in life and death greatly resemble those of the legendary heroes of Greece. The greatest anarchy now prevailed. The Danites not having yet conquered their territory, 600 men among them made an independent expedition north, and conquered a peaceful town of the Phœnicians, Laish, which was by them named Dan, and is henceforth mentioned as the northernmost town of the whole country, the opposite southern point being Beersheba. The concubine of a Levite having been outraged to death on a passage through Gibeah in Benjamin by some inhabitants of that place, her husband cut her corpse into pieces and sent them to all the tribes, calling for vengeance. The people assembled at Mizpah, and demanded from Benjamin the surrender of the criminals. The Benjamites refused to obey what they probably regarded as a usurpation by the confederacy of their sovereign rights, and a bloody civil war ensued, in which they were nearly exterminated after a heroic struggle against overwhelming forces. The people wept over their fratricidal victory, and 600 Benjamites who alone survived were allowed to seize wives (for the victors had sworn not to give them any) from among the girls dancing in the valley of Shiloh, on a sacred festival annually celebrated there. The

little book of Ruth, which contains the idyllic narrative of the Moabitish widow of that name, who, faithfully sharing the fate of her unfortunate mother-in-law, adopted her Hebrew home and religion, and married Boaz, is supplementary to the book of Judges. The 1st book of Samuel begins with the continuation of the latter. The priest Eli, who died suddenly on receiving the news of the defeat of his people by the Philistines, the death of his two sons, and the capture of the ark of the covenant, and his pupil, the prophet or seer Sammel, the son of Elkanah and the pious Hannah, were the last of the judges. The latter reestablished the exclusive worship of the Lord, routed the Philistines, restored the ark, and introduced schools of prophets, residing in Ramah, his native place, and regularly visiting Bethel, Gilgal, and Mizpah; and when he finally resigned the executive power, he could say to the assembled people at Gilgal: "Behold, here I am; witness against me before the Lord: Whose ox have I taken? or whose ass have I taken? or whom have I defrauded? whom have I oppressed? or of whose hand have I received any bribe to blind mine eyes therewith?" And the people testified to the purity of his career. But his sons, whom he appointed in his old age, acted very differently, and their corruption, but still more the desire for a strong military head, so natural after the previous long period of war, anarchy, and disunion, finally decided the people to urge the appointment of a king to rule them "like all other nations." The seer, deeply grieved by the proposed change of the Mosaic form of government, which is distinctly branded in the narrative as a repudiation of the divine rule itself, in vain painted to the people all the oppression, extortion, and degradation inseparable from monarchical rule (1 Sam. viii.); they persisted in their demand, and he was obliged to yield. Saul, the son of Kish, was appointed the first king of Israel, and the constitution of the monarchy (1 Sam. x. 25) was written and deposited in the sanctuary. The new rule was strengthened and became popular by a series of victories over the Ammonites, Moabites, Idumæans, Syrians, and Philistines. The eldest son of the king, Jonathan, distinguished himself as a heroic youth. Abner, a cousin of Saul, became commander of the army. Gibeah was the capital of the new monarchy. But an expedition against the Amalekites, though successful, was not executed according to the ordinance of Samuel, who now turned his influence against Saul. The spirit of the latter became troubled, and David, the son of Jesse of Bethlehem, was brought to soothe his temper with music. This young shepherd excited the jealousy of Saul by his triumph over Goliath, the Philistine giant, which decided a campaign, as well as by his subsequent successes when he married the princess Michal, and became the intimate friend of her brother Jonathan. Foreseeing the future destinies of the aspiring youth, Saul repeatedly attempted to take his life, and, exasperated by his failures,

and the protection bestowed on David by his children, Samuel, and the priests, he exterminated the inhabitants of Nob, a city of the latter, and passed his life in pursuit of his rival, who, with a band of desperate outlaws roving on the southern borders of the country, baffled every attempt to capture him. The extermination of wizardship was one of the acts of Saul. His reign was terminated by a catastrophe. A battle was fought against the Philistines at Mount Gilboa; the Hebrews fled, Jonathan and two other sons of Saul fell, and the king slew himself with his own sword. David, whose skill in poetry equalled his musical genius, honored in a touching elegy the memory of his fallen friend and foe (2 Sam. i.), who, "lovely and pleasant in their lives, were even in their death not divided: they were swifter than eagles, they were stronger than lions." Repairing to Hebron, he was anointed there by his own tribe of Judah as king, while Abner proclaimed a surviving son of Saul, Ishbosheth, at Mahanaim, who was acknowledged by all the other tribes (about 1055 B. C.). Bloody conflicts stained this double reign, David continually gaining the ascendancy through his heroic officers, the brothers Joab, Abisai, and Asahel, until the assassination of Abner and soon after of Ishbosheth, caused by private revenge, gave him the whole kingdom. He now conquered Zion from the Jebusites, made Jerusalem his capital, organized the national worship as well as the military power of the state, and by continual victories over all surrounding neighbors, except Phœnicia, a friendly country, extended the limits of his dominions N. E. as far as the Euphrates, and S. W. as far as the Red sea. Justice was strictly administered; literature and arts, especially poetry and music, flourished. Asaph, the founder of a family of sacred singers, rivalled the king in psalms; Nathan and Gad assisted him as prophets; Zadok and Abiathar as priests; Joab held almost continually the chief command of the army. But the palace of the king was often stained with crimes; David himself had much to repent of; the infamous deeds of his sons by various wives, Amnon, Absalom, and Adonijah, distracted the peace of his house and kingdom, and the two former had perished, and two great insurrections had been quelled, when he died after a reign of 40 years (about 1015). His son and successor Solomon, by Bathsheba, the widow of the assassinated patriot Uriah, a youth of 12 years, commenced his reign with the execution of his half brother Adonijah and the aged Joab, who had conspired against his succession; but he soon became famous for personal wisdom and scientific attainments, as well as for the splendor of his court and the prosperity of his subjects. He inherited a large army and a full treasury, but he used the former only to preserve peace and secure tribute from his neighbors, and the latter for the adornment of his country by numerous gorgeous public structures. He built the temple, which more than

all contributed to his glory, a royal palace, both in Jerusalem and with the assistance of Tyrian architects, an armory, Palmyra (Tadmor) in the desert, and other cities; made common naval expeditions with the king of Tyre, from Ezion Geber, a port on the eastern gulf of the Red sea, to the distant land of Ophir, which brought back gold, gems, precious woods, and rare animals; imported horses from Egypt for his numerous cavalry and war chariots; and introduced general luxury and culture by his example. The fame of his wisdom attracted visitors from many nations, among others the queen of Sheba (Sabæa) in southern Arabia. The authorship of 3,000 proverbs and 1,005 songs is mentioned among his literary merits; for he wrote on beasts, fowls, creeping animals, fishes, and on all kinds of plants from the cedar in Lebanon to the hyssop on the wall; and the extant philosophical book of Proverbs and the graceful Song of Songs bear his name. But, on the other hand, while the mighty monarch was teaching wisdom in admired works of literature, his personal example taught extravagance and folly. His court was as corrupt as it was splendid. The magnificence which he exhibited was not exclusively the product of foreign gold, tribute, and presents, but in part based on the taxes of his subjects. The army served not only to secure peace, but also as a tool of oppression. The public structures were built with the sweat of the people. Near the national temple on Mount Moriah, altars and mounds were erected for the worship of Ashtoreth, Moloch, and other idols, introduced by some of his numberless wives from their native countries, Phœnicia, the land of Ammon, Idumæa, and Egypt. Rezon was suffered to establish a hostile dynasty in Damascus, and Hadad to make himself independent in Idumæa. When Solomon died, after a peaceful reign of 40 years, the people felt themselves so exhausted that they demanded a considerable change from his son Rehoboam before they proclaimed him king at Shechem, where they had assembled for the purpose. Jeroboam, an Ephraimite who had already attempted an insurrection against the late king, now returned from his exile in Egypt and headed a deputation of the most distinguished citizens. Rehoboam promised an answer after 3 days. The experienced councillors of his father advised him to yield for the moment in order to be master for life; but the advice of his younger companions better suited his disposition, and his reply to the people was accordingly: "My father made your yoke heavy, and I will add to your yoke; my father also chastised you with whips, but I will chastise you with scorpions." The consequence of this was an immediate defection of 10 tribes, who proclaimed Jeroboam their king, while only Judah and Benjamin remained faithful to the house of David. Rehoboam, having fled from Shechem, where his receiver-general of taxes was stoned by the revolted people, returned to Jerusalem and assembled a powerful army to reconquer his lost dominions; but the prophet

Shemaiah dissuaded the people in the name of God from the civil war. Thus the division of the state into two separate kingdoms was consummated (975). The northern, comprising the country N. of Benjamin and all E. of the Jordan, was called Israel, or, from its principal members, Ephraim and Manasseh, the house of Joseph, and poetically Ephraim; its capital was Shechem, subsequently Tirzah, and finally Samaria (Shomron). The southern, from its chief tribe called Judah, had the advantage of possessing the sanctuary in the old capital, and being supported by the Levites and the priests, who gathered around it. To destroy the influence of the religious element upon his own subjects, who according to the Mosaic law were bound to repair 3 times in the year to the chosen sacred spot, Jeroboam revived the not yet extinct Egyptian superstitions of his people, established two golden calves as emblems of their divinity, at Dan and Bethel, on the N. and S. boundaries of his state, admitted non-Levites to the priestly office, and introduced new festivals and even a new calendar. The Mosaic institutions being thus systematically excluded from the state, idolatry, despotism, and corruption prevailed throughout the 250 years of its existence, almost without interruption. While these evils remained permanent, the condition of the people was made still worse by a continual change of masters. Usurpation followed usurpation; conspiracy, revolt, and regicide became common events. The house of Jeroboam was exterminated with his son Nadab by Baasha, who reigned at Tirzah, and whose son Elah was assassinated while drunk by Zimri, one of his generals. At the same time another of his officers, who commanded an army besieging Gibbethon, a city of the Philistines, was proclaimed king by his troops, marched upon Tirzah, and took it, and Zimri after a reign of 7 days burned himself with his palace. A part of the people now wanted Tibni, but Omri prevailed, and Tibni died. Omri, who built Samaria and made it his capital, was succeeded by his son Ahab, whose wife Jezebel, a Sidonian princess, was fanatically zealous in propagating the worship of the Phœnician Baal, and in persecuting the prophets of monotheism, who were almost exterminated. Ahab having died of a wound received in the battle of Ramoth-Gilead against the Syrians under Benhadad II. (897), his two sons Ahaziah and Jehoram successively reigned after him; but with the latter the idolatrous house of Omri was exterminated by Jehu, who was proclaimed king by the officers of the army which he commanded against Hazael of Syria in Gilead (884). Jehu, who had been anointed by the prophet Elisha, abolished the worship of Baal, but left the institutions of Jeroboam. His dynasty, assisted by the influence of Elisha, was in many respects prosperous. To it belonged the kings Jehoahaz, Joash, Jeroboam II., and Zechariah, with whose murder by Shallum it ended (773). Shallum met with the same fate after a month through Menahem,

whose son Pekahiah was slain and succeeded by his chariot driver Pekah. The murderer of the latter, Hoshea, was the last of the usurpers, and the last king of Israel. This state, which during all its existence was exposed to violent shocks from its neighbors, Judah, the Philistines, Moab, which revolted, and especially from the Syrians of Damascus, against whom its possessions beyond the Jordan could seldom be defended, had recovered some strength by repeated victories under Joash and Jeroboam II.; but soon after, rotten and decayed through idolatry, despotism, and anarchy, it became an easy prey to the growing power of Assyria, to whose king Phul it became tributary after an invasion in the reign of Menahem. Tiglath Pileser conquered its E. and N. provinces, carrying off the inhabitants to Assyria, in the time of Pekah, and Salmanassar destroyed it entirely, conquering the capital, Samaria, after a siege of 3 years (721), taking Hoshea prisoner, and dispersing the inhabitants throughout the N. E. provinces of his empire, where their idolatrous habits made them likely to lose their nationality and soon to disappear among their neighbors, though scattered remnants may occasionally have emerged at later periods, and in various countries, as representatives of the 10 tribes of Israel. The prophets Ahijah of Shiloh, who contributed to the election of Jeroboam I., Elijah, the hero of the Mosaic religion under Ahab, his great disciple Elisha, the two contemporaries of Jeroboam II., Amos and Hosea, Micah, who lived in the last period, and many others, strove in vain to check the growing power of evil by appeals to the conscience of rulers and people, boldly denouncing the despotism, hypocrisy, and licentiousness of kings, princes, and priests, the selfishness, pride, and extravagance of the rich, the extortions, deceptions, and seductions practised on the people, and again and again kindling the spirit of justice, truth, patriotism, humility, or hope. The extant books of the three last named prophets, while painting in the darkest colors the wickedness and perverseness of the mighty and the degradation and misery of the poor, console us by showing what pure and sublime ideas of justice, morality, and fraternity were still entertained and taught, what bright visions of a future state of mankind could still be conceived, and what severe truths and fiery reprimands were still listened to even in those times. Without these living thoughts of that distant age, without these evidences of continued moral struggles and sublime efforts, the history of the kingdom of Israel, as preserved in the books of Kings and Chronicles, would be but a gloomy record of crime, bloodshed, and misery.—The rival state of Judah enjoyed more frequent periods of prosperity and lawful order, as well as a longer duration. There the interest of the dynasty, which continued in a direct line of succession down to the latest period, was identical with that of the people. Their common enemy was the idolatry which reigned in Israel. Their common

safeguard was the law, which was here supported by the Levites, and more effectively defended by the prophets. Corruption, however, often led both government and people to break down their only wall of protection, and to imitate the pernicious example of their neighbors. This tendency prevailed as early as the reign of Rehoboam, the most important event of which was the invasion of Shishak (Sheshonk), king of Egypt, who pillaged the temple and the royal palace. War against Jeroboam was almost continually waged during this and the following short reign of Abijam. The successor of the latter, Asa, abolished idolatry, checked public immorality, routed an invading army of Ethiopians, resisted the attacks of Baasha of Israel through an alliance with the king of Damascus Syria, and fortified Gibeah and Mizpah against an invasion from the north. Jehoshaphat, his son, made peace with Israel, and even fought in alliance with Ahab against Benhadad of Syria (897), subdued Idumæa, and fought successfully against the Moabites and their allies, but was unfortunate in an attempted expedition to Ophir. Internally, too, his reign was one of the most successful, the salutary reforms of his father being further developed. But his son Jehoram, having married Athaliah, a sister of Ahab, followed the example of the court of Samaria, and also lost his father's conquest, Idumæa, by a revolt. Ahaziah was equally attached to the house of Ahab, whose fate he shared. Having gone to visit Jehoram, he was mortally wounded by the conspirators under Jehu, and expired on his flight at Megiddo (884). On receiving news of that event, Athaliah his mother usurped the government, exterminating all the royal princes except one, Joash, a child of one year, who was saved by his aunt and secreted in the temple. Six years later Jehoiada, an old priest, matured a conspiracy, the legal heir to the house of David was produced in the temple, and the queen, who hastened thither, was slain. The altars of Baal were now destroyed, and the temple repaired under the influence of Jehoiada; but an invasion of Hazael from Syria could not be repulsed, and the capital itself was saved only by an immense ransom. After the death of Jehoiada Joash abandoned his teachings, and even the son of his benefactor, Zechariah, who boldly reprimanded him, fell a victim to his tyranny, which was ended with his life by a conspiracy (838). His successor Amaziah punished the murderers of his father, and made a successful expedition to Idumæa, but was made prisoner in a battle against Joash, king of Israel, which he had wantonly provoked by a challenge, and, having returned after the death of that king to his conquered and unfortified capital, was deprived by a conspiracy of his throne and life. The following reign of Uzziah or Azariah was not only one of the longest in the history of the Hebrews, lasting 52 years, but also distinguished by victories over the Philistines, Arabians, and Ammonites, and by the flourishing condition

of husbandry, mechanical arts, and literature. Beside Amos and Hosea, who were active also in Judah, Jonah and Joel were among the prophets of that period. Of the last we still possess a beautiful poetical description of a dreadful devastation by locusts, perhaps allegorically of barbarians, when "the land was as the garden of Eden before them, and behind them a desolate wilderness." Another destructive event was a long remembered earthquake. Jotham, the son of Uzziah, who during the last years of his reign acted as regent, continued after his father's death (759) his beneficent rule; but his son Ahaz again introduced idolatry, and his reign was disgraceful and disastrous. Rezin and Pekah, allied against him, advanced as far as Jerusalem, which was saved only by the dearly purchased aid of Tiglath Pileser, king of Assyria, who conquered Damascus, carried its inhabitants into captivity, and slew Rezin. Ahaz declared himself the subject of his Assyrian deliverer, and also suffered attacks by the revolted Philistines, while the state of the interior of the country provoked the immortal denunciations of Isaiah and Micah. "How is the faithful city become a harlot!" exclaims the former of Jerusalem. "It was full of judgment; righteousness lodged in it; but now murderers. Thy silver is become dross, thy wine mixed with water; thy princes are rebellious, and companions of thieves; every one loveth gifts, and followeth after rewards; they judge not the fatherless, neither doth the cause of the widow come unto them." The latter thus addresses the rulers: "Hear this, I pray you, ye heads of the house of Jacob, and ye princes of the house of Israel, that abhor judgment, and pervert all equity. They build up Zion with blood, and Jerusalem with iniquity. The heads thereof judge for reward, and the priests thereof teach for hire, and the prophets thereof divine for money." But these prophets express in no less glowing words their hopes of a better future, which seemed to be realized in the succeeding reign of Hezekiah the son of Ahaz. This pious king followed almost entirely the injunctions of Isaiah, who was bold enough to advise an uncompromising abolition of ancient abuses and restoration of the Mosaic law, war against the Philistines, independence of Assyria, and at the same time the rejection of any alliance with Egypt; and was powerful enough to brave the general corruption, to baffle the plots of the court, and to maintain the courage of the people as well as of the sick king during the great invasion of Sennacherib, when the state was on the brink of ruin. Thus Judah escaped the fate of her sister state, which had a few years before been conquered and devastated by the Assyrians, and which now began to be re-peopled principally by Cuthæans, an idolatrous people subject to their rule, who, mingling their rites with those of their new territory about Samaria, became afterward known under the name of Samaritans (*Cuthim*), while scattered portions of the ancient Hebrew inhabitants

augmented the number of the subjects of Hezekiah. But the reign of his son Manasseh, longer than that of Uzziah, was more disgraceful than that of Ahaz. Idolatry was not only publicly introduced, but had its altars even on Mount Moriah. The most abominable practices prevailed, including the bloody worship of Moloch, and Jerusalem was filled with the blood of the innocent victims of tyranny, while the limits of the country were narrowed by hostile neighbors. Amon, the son of Manasseh, followed in his father's footsteps, but was murdered after two years. Josiah, his successor, however, was a zealous imitator of Hezekiah, and was assisted in his radical reforms by the reviving influence of the prophets, among whom were Nahum, Zephaniah, the young Jeremiah, and their female colleague Huldah. Nahum celebrated the final fall of Assyria, and the destruction of Nineveh its capital, "the bloody city full of lies and robbery, (whence) the prey departeth not," which was then completed by the allied Babylonians and Medes. But the power of Babylonia, lately founded by Nabopolassar, was now growing to a threatening extent, and the position of the weak kingdom of Judah between this and the rival power of Egypt doomed it to a sudden catastrophe. Pharaoh Necho having commenced a campaign against Babylonia through Philistia, Josiah opposed his march, and fell in the battle of Megiddo. His son Jehoahaz was sent prisoner to Egypt, and the younger Jehoiakim (or Eljakim) appointed king in his stead. The great victory of the Babylonians, however, over Necho on the Euphrates, soon made Jehoiakim a vassal of their empire. He afterward revolted, against the advice of Jeremiah, who saw the impossibility of resisting the sway of Nebuchadnezzar, the successor of Nabopolassar. The king was as little inclined to listen to his counsel in his foreign as he was in his domestic policy. Jeremiah's prophecies were burned. Another prophet, Uriah, was punished for the boldness of his rebukes with death. The Chaldeans soon invaded the country, and were joined by its neighboring enemies. After the death of his father and a short siege of Jerusalem, Jehoiachin or Jecooniah, the son of Jehoiakim, terminated the war by a voluntary surrender to Nebuchadnezzar, who sent him with his family, his army, and thousands of the most important citizens, to Babylonia as captives. The treasures of the temple and royal house were plundered. Mattaniah, an uncle of the dethroned king, was appointed his successor, as vassal of the conqueror, under the name of Zedekiah (598). It was the last reign of the house of David. Zedekiah, a weak prince, was induced by a misguided patriotism to revolt against Nebuchadnezzar. Jeremiah in vain exerted all his zeal and eloquence to dissuade the king and the people from this pernicious step. He was persecuted by both; the seductive influence of false prophets prevailed. The 2d siege of Jerusalem by Nebuchadnezzar now ensued (588). It fell after a desperate defence.

The king, who attempted to escape with the remnants of his troops, was made prisoner in the neighborhood of Jericho, was deprived of his eyes after having seen the slaughter of his children, and was sent in chains to Babylon. The temple was burned, its vessels were plundered, the walls and palaces of Jerusalem destroyed, and all important or wealthy citizens carried into the Babylonish captivity. Jeremiah was spared and allowed to remain with Gedaliah, whom Nebuchadnezzar appointed his viceroy at Mizpah, and around whom a number of the remaining people soon gathered. But this last centre, too, was soon destroyed by the assassination of Gedaliah. A number of the surviving officers emigrated with their followers and Jeremiah, who tried in vain to dissuade them, to Egypt, whither the sword of the Chaldeans still followed them. The annihilation of the state of Judah was complete. Jerusalem "sits solitary, the city that was full of people is become as a widow; the princess among the provinces is become tributary. She weepeth sore in the night; among all her lovers she hath none to comfort her. Judah is gone into captivity; she finds no rest. The ways of Zion do mourn, because none come to the solemn feasts; all her gates are desolate; her priests sigh, her virgins are afflicted." These elegiac sounds of the "Lamentations" are not the most touching of the numerous effusions that treat that tragic end. Speaking in the name of the Lord, Ezekiel exclaims: "My sheep wandered through all the mountains, and upon every high hill; yea, my flock was scattered upon all the face of the earth, and none did search or seek after them." Habakkuk, speaking of the Chaldees, "that bitter and hasty nation," asks God: "Thou art of purer eyes than to behold evil, and canst not look on iniquity; wherefore lookest thou upon them that deal treacherously, when the wicked devoureth him that is more righteous than he?" Jeremiah curses the day of his birth, and accuses God. Providence is also arraigned in the book of Job, a sublime lyrical drama, which numerous critics regard as a production of that time. A number of psalms, too, belong to the last period of the kingdom of Judah. But Babylonia, the prison of the Jewish nation (for this name had now become the most familiar), was destined also to become the cradle of its regeneration. The Babylonish captivity was the "furnace of affliction" which purified it, and, as is said in Zechariah (xiii. 8, 9), two parts perished, but the third part was left therein, brought "into fire as silver is refined, and as gold is tried." The most eminent of the people had been transplanted there with Jeconiah, and afterward, among others, Ezekiel, Daniel, and his pious companions at the court of Nebuchadnezzar, Hananiah, Mishael, and Azariah; and their activity in reviving the spirit of religion and nationality is evident from the numerous contributions to the Hebrew literature of that period, all glowing with enthusiasm and unconquered hope.

The court, that source of corruption, was no more; the priests of Baal and Moloch, so long fattened on lies, had disappeared with the altars of their idols; the voluptuous groves of Ash-toreth could not be transplanted into the land of dreary captivity; Zion was regretfully remembered on the brooks of Babylon, and the true admonishers of the people, who had predicted all this, now found more willing ears. Their consolations, too, and the deliverance which they promised, were soon to be confirmed; and the captives, who were full of revengeful hatred toward their oppressor, the profligate and treacherous mistress of the world, heard with secret delight of the warlike preparations of the Medo-Persian empire against her. There are no more vigorous passages in the Hebrew Scriptures than those which describe Cyrus, the "servant of the Lord," called to "execute his vengeance," his army, his victorious approach, and the fall of Babylon (538). The last ruler of that city, Belshazzar, was drinking wine with his lords, his wives, and his concubines, from the golden and silver vessels of the temple of Jerusalem, when "one messenger was running to meet another" to tell him "that his city was taken at one end." The Persian conqueror did not disappoint those who had predicted, and perhaps secretly promoted his triumphs. He allowed the Jews to return to their country, where they could be useful by forming a kind of outpost against Egypt, and to rebuild their capital and temple. The first and largest body of returning patriots consisted of more than 42,000 persons, under the lead of Zerubbabel, a prince of the house of David, and the high priest Jeshua. But the idolatrous Samaritans, whom the Jews would not admit to have a share in the new temple, exerted themselves to prevent their rebuilding and fortifying Jerusalem, calumniating them at the court of Persia, particularly under Cambyses (529-'22) and Pseudo-Smerdis (522). Darius, however, fully confirmed the permission of Cyrus (521). The prophets Haggai and Zechariah (assisted, perhaps, by Obadiah, who seems to have been their contemporary) inspired Zerubbabel, the priests, and the people with fresh zeal, and after 5 years the new temple was completed (516). The events which are described in the book of Esther—the elevation of the Jewess of that name (or Hadassah) to the dignity of Persian queen, the high official career of her relative Mordecai, the schemes of Haman, a courtier and personal enemy of the latter, to destroy all the Jews of the Persian empire, his fall, and the almost miraculous escape of the people through Mordecai and Esther—probably refer to the reign of Xerxes (485-'65), the son of Darius, though the name Ahasuerus is used in the Scriptures to designate various monarchs of the Persian empire. Under the following reign of Artaxerxes, Ezra, the pious scribe (or critic, *sofer*), led a new colony of Jews from beyond the Euphrates to Jerusalem, where he carried through a series of important reforms, completing the restoration

of the Mosaic law, for which he was afterward revered as the second lawgiver of his people. The condition of the Jews in Palestine, however, or rather in Jerusalem and its vicinity, was not cheering. The city had no walls or gates, and poverty prevailed. To remedy these evils Nehemiah, the Jewish cup-bearer of Artaxerxes, started from Susa with the permission of the monarch and the dignity of governor (444). The work of restoring and fortifying Jerusalem was now carried on and executed with the utmost zeal, though the laborers were often obliged to work under arms, the Samaritans and their friends threatening an attack. Notwithstanding his dignity, Nehemiah voluntarily shared the toils and privations of his brethren. He restored order, assisted the poor, abolished the abuses of the rich, and strengthened the observance of the law. After a long absence at the royal court, during which fresh disorder had arisen, he resumed his pious and patriotic work, in which he was assisted by Malachi, the last of the known prophets. The enmity of the Samaritans, though baffled in its first assaults, remained active down to a much later period, their separation having been sanctioned by a rival temple on Mount Gerizim. The Jewish temple on Mount Moriah had a successive line of hereditary high priests in the direct descendants of Jeshua, of whom Jaddua held that most influential office at the time of the conquest of the Persian empire by Alexander, whose wrath he is said to have diverted from Jerusalem (332). The names of the Persian governors during the last century of that empire are unknown, this being altogether the most obscure period in the history of the Jews. It seems to have been a time of comparative tranquillity and prosperity; at least it included no particular national disaster, as it added no day of fasting to those recently established in commemoration of the fall of Jerusalem, the death of Gedaliah, &c. But the same century, together with the time of Ezra, may certainly be regarded as the period of the most important religious developments, of a permanent consolidation of Judaism. The first impulse had probably been given in Babylonia, during the active literary period of the captivity. But Ezra the *sofer*, his contemporaries Haggai, Zechariah, Nehemiah, and others, "the men of the great assembly" (*anshey keneseth haggadol*), and the successive *soferim*, are the real authors of the restoration and the new developments connected with it. The sacred Scriptures were collected, authenticated, and arranged into a canon, including the most precious remnants of a vast literature, among the lost parts of which were the often mentioned and quoted "book Hayashar," probably a collection of historical songs, the book of the "Wars of the Lord," the special "Chronicles" of the kings of Judah and Israel, the prophecies of Nathan, Ahijah, Iddo, and others, the "History of Solomon," various works of this king, and an endless multitude of others; their great number was complained of in the philosophical book

of Ecclesiastes, a work commonly attributed to Solomon, but by numerous critics to a very late period. The Pentateuch was publicly read, taught in schools, explained, hermeneutically expounded (*midrash*), and translated into the Chaldee language, which the common people had adopted in Babylonia, together with various eastern notions concerning angels, spirits, and other supernatural things. The legal or religious traditions, explanatory or complementary to the law of Moses, were traced back through the prophets and elders to that lawgiver, and systematically established as the oral law (*torah* or *debarim shebbaal peh*). New obligations were added to form a kind of "fence" (*seyag*) around the law, preventing its infraction, and founded on the authority of the scholars and wise men of the age (*dibreiy soferim, mitzvath zekenim*). The following century and a half, when Judæa was a province of the successors of Alexander in Egypt and Syria, the Ptolemies and Seleucids, is marked by new features. Greek refinement, science, and philosophy spread among the Jews, particularly among the flourishing colonies in Alexandria and other cities of the Ptolemies. A part of the people, especially the wealthier, adopted the Epicurean notions of the demoralized Greeks of that time, and were finally organized as a sect, denying the immortality of the soul, rejecting the authority of tradition, and adhering to the literal sense of the Mosaic law; while the teachings of the stoics agreed well with the more austere life of the followers of the "great assembly," who maintained their preponderance with the people. As a sect the former were called Sadducees, the more ascetic of the latter Pharisees. The derivation of both these names is as little settled as is that of the name of the Essenes, who appear about the close of this period, forming secluded, industrious, and socialistic communities, and engaged in medical, mystical, and ascetic practices. The Samaritans, who, adopting in part the Mosaic rites, had succeeded in attaching to their temple a part of the neighboring Jews, now followed the example of the Hellenizing cities of Syria, and made little opposition to the spreading worship of the Greek gods. The Greek language became common in Judæa, and the Greek translation of the Pentateuch prepared under Ptolemy Philadelphus in Egypt (the Septuagint) was used in the synagogues of that country. A Syrian dialect of the Aramaic was used for the same purpose by the Samaritans, and the pure Chaldee prevailed among the Jews beyond the Euphrates. Politically no less than in matters of religion, Judæa seems to have been ruled by the high priests, who had to be confirmed by the Egyptian or Syrian kings, and the sanhedrim of Jerusalem, a college of 70, with a president (*beth din haggadol*, high court). After the death of Alexander (323), the little province frequently changed masters, until it was definitively attached to the empire of Ptolemy I. Soter, under whom the celebrated Simon the Just (or Righteous) officiated as high priest, and Antigonus of

Socho as president of the sanhedrin. The uncertainty of possession made the foreign rulers more lenient. The country was growing in wealth and population, in spite of large colonies drawn to Alexandria by Alexander the Great, Soter, and others. These were particularly well treated, and enjoyed privileges which made them an object of envy. They, like their brethren of Babylonia and other countries of Asia, enriched Jerusalem and the temple by their gifts and visits during festivals. Ptolemy II. Philadelphus (285-246) was especially favorable to the Jews. Under his successors, however, Judæa grew impatient of the Egyptian rule, and when Antiochus the Great attacked the young Ptolemy V., the Jews willingly aided him in driving the Egyptians from their land (198). They soon had reason to regret this change of dynasty. The Seleucidæ were bent on Hellenizing their empire, and were offended by the determination of the Jews to preserve their own national and religious peculiarities. The treasures, too, which had been slowly accumulated in the temple of Jerusalem, tempted their avarice, while they also augmented the number of priestly office seekers. Tyranny and corruption growing together, the dignity of high priest was finally converted into an office for sale. One Onias was robbed of it for the benefit of his younger brother Jason, who offered 360 talents to the court of Syria; a third brother, Menelaus, wrested it from him, giving 300 more, and strove to maintain himself in his usurpation by scandalously promoting the arbitrary schemes of Antiochus Epiphanes. Being driven from the city by Jason and his followers, and besieged in the citadel, he was rescued by Antiochus, who destroyed a part of the city, sold many of his opponents into slavery, and robbed the temple (170). But worse was to follow. During the second expedition of the Syrian king against Egypt, a false report of his death spread in Judæa, and Jerusalem immediately rose against his officers. But the Hellenizing Jews opened its gates to the returning king, and an unparalleled slaughter of the religious inhabitants ensued (169). Not satisfied with this, Antiochus destroyed the walls of the city, garrisoned a new citadel with his soldiers, and decreed the general and exclusive introduction of Greek idolatry. The image of the king was placed in the temple, swine were sacrificed on the altar, new altars were everywhere erected for the obligatory worship of the Olympian Jupiter, the Hebrew Scriptures were burned, circumcision was prohibited, and every act of opposition made a capital crime and punished with extreme cruelty. Thousands after thousands were dragged into captivity, sold as slaves, or butchered. Finally the king departed on an expedition against the Parthians, leaving the completion of his work to his general Apollonius (167). The latter continued it in the spirit of his master, but soon met with a sudden check. Mattathias, an old priest of the village of Modin, and of the distinguished

house of the Asmoneans, and his 5 sons John (Johanan), Simon, Judas, Eleazar, and Jonathan, commanded to sacrifice to Jupiter, drew their swords in defence of their religious liberty, and soon after were able to defend that of others. The people flocked after them into the desert, whence they sallied forth to destroy the altars of their oppressors. Contempt of death gave victory, and victory created new warriors. The work of liberation was successfully commenced when the old patriot died (166), leaving the command in the hands of Judas, who well deserved by his overwhelming victories the surname of the Hammer (*Maccab*), though the name of Maccabees, which is applied to the whole house, and the title of the apocryphal books of their history, may have been derived from the initials of a supposed scriptural sign, or from those of the name of the father, M(i) K(amokha) B(aelin) J(ehovah) ("Who is like thee among the gods, O Everlasting?"), and M(attithyahu) K(ohen) B(en) J(ohanani) (Mattathias the priest, son of Johanan). Terror reigned among the Syrians in Judæa. Their greatly superior forces suffered defeat after defeat under Apollonius, Seron, Lysias, Timotheus, Nicanor, and other generals. Jerusalem was reconquered, the temple purified, a treaty of alliance concluded with the Romans, the traitor Menelaus was executed by order of Antiochus, and the latter soon after died (164). But the bold struggle of the heroic brothers again became desperate. Eleazar (or perhaps another warrior of the same name), rushing through the thickest of the enemy to transpire an elephant, on which he supposed the young king Eupator himself to be seated, was crushed under the belly of the falling animal. Judas, seeing himself deserted by most of his followers at the approach of an immense host under Bacchides, and having no alternative but flight or death, chose the latter, attacked the Syrians with 800 men, broke through one of their wings, but was surrounded by the other, and perished with all his companions (160). The surviving brothers again fled to the desert of the south, carrying on a desultory warfare, in which John soon after fell. But the protracted struggles for succession to the throne of Syria between the various kings and usurpers who followed Eupator, Demetrius Soter the son of Epiphanes, his pretended brother, Alexander Balas, Demetrius Nicator the son of Soter, Antiochus the son of Balas, Antiochus Sidetes the son of Nicator, and Tryphon, gave Jonathan, who now commanded, and after him Simon, ample opportunity to restore the fortune of the war. Jonathan's friendship was soon sought by the rival pretenders; he made peace with the one or the other, was acknowledged as high priest, *strategus*, and ethnarch of Judæa, and was successful in his long wars, but was finally enticed to an interview with Tryphon, and assassinated with his sons. Simon conquered the citadel of Jerusalem, renewed the alliance with Rome, and was proclaimed an independent prince. The indo-

pendence of Judæa was successfully defended against Antiochus Sidetes under the command of John and Judas his sons, but the old man was soon after assassinated with his sons Judas and Mattathias by his own son-in-law Ptolemy (135). His surviving son, John Hyrcanus, who succeeded him, resisted the invasion of Antiochus Sidetes, concluded a peace, and further developed the independence of the country, extending its limits by the conquest of Idumæa, and of Samaria, which he destroyed, as well as the temple on Mount Gerizim. The Samaritans were thus crushed, but the Sadducees attained great influence under his reign, and the religious dissensions, assuming also a civil aspect, gradually undermined the foundations of the newly restored state. John Hyrcanus, and his sons Aristobulus (106-5) and Alexander Jannæus (105-79), belong to the small number of Maccabees who died a natural death; for the race of priestly warriors, who conquered their dignity by the sword, were doomed to perish by the sword, and only the earlier members of the house who fought for the liberty of their people fell in glorious battles. Aristobulus, who assumed the royal title, ordered the murder of his brother Antigonus, while their mother was starved to death in a dungeon. Alexander Jannæus proved equally barbarous in a war of 6 years against the majority of his people, who abhorred him as a debauched tyrant and Sadducee, and stained his victory by the execution of 800 of the most important rebels before the eyes of his revelling court. Thousands sought refuge in flight, and he was allowed to continue his reign till his death, when he advised his wife to follow an opposite line of policy. She accordingly chose her councillors from among the distinguished men of the national party, and recalled the exiles. Of her two sons, she appointed Hyrcanus high priest, keeping the political rule herself. Dissatisfied with this arrangement, the younger Aristobulus sought for support among the Sadducees, and after the death of their mother (71) a long civil war was waged by the two brothers, which was terminated only by the interference of the Romans, to whom both applied. Scaurus, the lieutenant of Pompey the Great in Syria, decided for the younger of the brothers (63). But Pompey soon after reversed the sentence, besieged Aristobulus in Jerusalem, took the city and the temple, entering both amid streams of blood, and confirmed Hyrcanus as high priest, in which capacity he became tributary ethnarch of the Romans. Aristobulus and his sons, Alexander and Antigonus, were carried as captives to Rome. Judæa, with narrowed limits, was now a province of the Roman republic, which was just advancing to its furthest boundary in the East. In the name of Hyrcanus it was governed by Antipater, his crafty Idumæan minister, who ruled his feeble master, and was finally himself established by Cæsar, after the fall of Pompey (48), as Roman procurator of Judæa. But Aristobulus and his two sons escaped from Rome, and made

desperate efforts to recover their dignity, but all of them perished in the successive attempts. Antigonus procured aid from the Parthians, who, having vanquished Crassus (53) and other Roman generals, invaded Judæa and carried Hyrcanus into captivity. But he finally succumbed to the son of Antipater, Herod, who on his flight to Rome had gained the favor of the new triumvirs, and who now inaugurated under their auspices as a powerful, independent king, the last dynasty in Judæa, the Idumæan (39). This prince, who as if by irony has been called the Great, was the slave of his passions, as well as of the Romans, and the bloody master of his subjects. His ambition made him rival in splendid structures, among which was the rebuilt temple, in the erection of new fortresses, citadels, and cities, and in unlimited sway, the glory of King Solomon, but did not prevent him from basely creeping before Mark Antony, his mistress Cleopatra of Egypt, and his rival Octavianus, and from sacrificing the most sacred customs and usages of the people in order to flatter the vanity of his foreign supporters. Gladiatorial games, statues, and other things abhorred by the Jews, were introduced in their cities, and the Roman eagle was placed on the top of the new temple. The desire of the people for the national house of the Maccabees was to be stifled in the blood of its last descendants, though Herod was himself the husband of Mariamne, the granddaughter of Hyrcanus by her mother Alexandra, and of Aristobulus by her father Alexander. Antigonus was executed by the Romans at Damascus; the old Hyrcanus was enticed from Babylon to share the same fate in Jerusalem; the young and beautiful brother of the queen, the high priest Aristobulus, was treacherously drowned while bathing with the king. Herod's own house followed, treacherous intrigues and the dread of conspiracies demanding new victims. His uncle Joseph, his frantically beloved, beautiful, and noble Mariamne, her mother Alexandra, his two sons by Mariamne, the favorites of the people, perished successively at his order, and finally, 5 days before his own death, his son by another wife, Antipas or Antipater, next to Herod's sister Salome the chief cause of the last murders and of the king's dreadful agonies. The blood of many other innocent persons was shed, attempts at insurrection or regicide being quelled or punished with remorseless rigor. In extent of possessions, however, Herod's reign by far surpassed the power of his predecessors. Augustus divided his territory among his 3 surviving sons. Archelaus received, as ethnarch, half of them, viz.: Judæa (proper), Samaria to the N., and Idumæa to the S.; Philip and Herod Antipas, as tetrarchs, received the other half—the former, Batanæa, Trachonitis, and Auranitis, E. of the Jordan (Peræa), and the latter, Galilee W. of the Jordan and N. of Samaria, with some slight additions. Anarchy was a natural consequence of this arbitrary arrangement, and it came with all its horrors.—Such was the political condition of the Jewish state in the first

year of the Christian era, 4 years after the birth of the founder of the Christian religion, for an account of whose life, doctrine, and death (in the year 33, under the sway of the Roman procurator Pontius Pilate, the possessions of Archelaus having been annexed to the Roman province of Syria) we refer the reader to special articles under the appropriate heads. The religious and literary institutions of the people had in the meanwhile received a remarkable development during the Asmonean period, on the basis of the *soferim*, and principally under the lead of the successive schools of the *hakhamim* (scholars) Jose of Zeredah and Jose of Jerusalem, Joshua ben (son of) Perachiah and Nittay of Arbel, Judah ben Tabbay and Simeon ben Shetah, and Shemaiah and Abtalion; and it reached a most flourishing condition under the school of the great Hillel the Babylonian, president of the sanhedrim like all the first of the above named pairs, and the rival school of the austere Shammai, in the reign of Herod. The eminent philosophical book of Ben Sirach and the first book of the Maccabees are the products of the earlier part of that period, while the age of the books of Tobit, Judith, Baruch, and other apocryphal writings, is unknown. The simultaneous literary activity of the Jews in Africa is evinced in the book of Wisdom, by their numerous contributions to Hellenistic poetry and history (Jason, Alexander Polyhistor, Ezekiel, &c.), and especially to Platonic philosophy, from Aristobulus, the Jewish teacher of Ptolemy Energetes, to Philo, the distinguished deputy of the Alexandrian Jews to the Roman emperor Caligula. The emperors were already becoming the exclusive masters of Palestine. Archelaus was carried captive to Gaul under Augustus (8), and separate procurators ruled Judea, Samaria, and Idumæa. Philip's possessions were attached to Syria after his death (35) by Tiberius, but afterward given by Caligula to Herod Agrippa, a grandson of Herod, and brother of Herodias, who, being unlawfully married by Herod Antipas, caused the deposition of the latter, and the annexation of his tetrarchy to the dominion of Agrippa, who even succeeded in reuniting for a short time, in the reign of Claudius, the whole of Palestine. After his death (44) his territory was again ruled by procurators, and only a small portion was afterward given to his son Agrippa II. (53). The condition of the country was dreadful. The emperors, at that time the vilest of men, demanded divine honors, their statues were erected in the temple, the procurators grew rich by extortions, the petty Herodian courts shamelessly imitated the licentiousness of the imperial, robbers infested the mountainous regions, impostors and fanatics raised the standard of rebellion, and insurrections led to new oppression, both religious and civil. Nero's rule, and the extortions of his procurator Gessius Florus, finally drove the people to despair. Death to the Romans or to themselves became the cry of the fanatics and the poor. The Sadducees and the rich oppos-

ed it in vain, though aided by the troops of Agrippa. The temple of Jerusalem, the ancient capital itself, and numerous strongholds in the country were taken by the insurgents (66). The Roman governor of Syria, Cestius Gallus, who hastened to Jerusalem, was routed near that city. The zealots now organized a general rising. The priest Josephus, the historian, was sent to arm and defend Galilee. But one of Nero's best generals, Vespasian, was already approaching from the north (67); and Titus, his son, brought new legions from Egypt. The Jews fought with Maccabean valor near Joppa, at Mt. Gerizim, in the streets of Gamala, at Jotapat, and other places. But Josephus's army perished in the struggle about Jotapat, and he was made prisoner; Galilee was lost, and civil carnage raged within the walls of Jerusalem between the moderates under the priest Eleazar, the terrorists under John of Giscala, and the volunteers under Simon the Idumæan. Vespasian now advanced and took most of the strongholds (68). The events which followed the death of Nero, however, checked his progress. Vespasian himself being proclaimed emperor by his legions (69), Titus took the command. Jerusalem, Masada, Machærus, and Herodium were still to be besieged. The northern part of Jerusalem, Bezetha, was first taken by the Romans with the external wall. The middle wall, too, fell into their hands, but the defenders, now united and heroically fighting, drove them out. The Roman resolved upon conquering by hunger, and this brought pestilence to his assistance. Hay, leather, and insects were finally consumed; the victims could no longer be buried, but were thrown over the wall. Deserters and fugitives were mutilated by the besiegers or driven back. The castle Antonia, and with it the second wall, were finally taken (June, 70). John and Simon still refused to hear of surrender. In August the temple was stormed, and Titus was unable to prevent its becoming a prey to the flames. The last defenders retired to the fortified upper city, which fell in September. Jerusalem was razed to the ground, its surviving inhabitants were slaughtered by thousands, sold into slavery, or doomed to perish in public fights with wild beasts before Romans and Greeks, at the command of the future *amor et delicia generis humani*. Herodium, Machærus, and Masada still defended themselves for a time. In the latter the conquerors found only a few children, the last men having died by their own hands. A million of Jews perished in this war, which found an eloquent but partial historian in the learned captive Josephus. The later and still more furious risings of the scattered people in the reigns of Trajan and Hadrian in Cyrene, Egypt, Cyprus, and Palestine, where Bar-Cokeba for years victoriously maintained himself against the Roman generals until he fell with his last stronghold Bethar, are known only from scattered passages full of exaggerations, dictated by hatred on one side and patriotic admiration

on the other.—The last insurrection, and the bloody persecutions which followed it, finally broke the strength and spirit of the people. Their leaders prohibited every attempt at insurrection in the name of religion, and were obeyed. Hadrian's *Ælia Capitolina* rose on the sacred ground of Jerusalem, and his decrees forbade the Jews to enter its precincts. Its environs were desolate. The land of Israel was no more; the people scattered all over the world. The previous invasions and conquests, civil strifes and oppression, persecution and famine, had carried hosts of Jewish captives, slaves, fugitives, exiles, and emigrants, into the remotest provinces of the Medo-Persian empire, all over Asia Minor, into Armenia, Arabia, Egypt, Cyrene, Cyprus, Greece, and Italy. The Roman conquest and persecutions completed the work of dispersion, and we soon find Jews in every part of the empire, in the regions of Mt. Atlas, on both sides of the Pyrénées, on the Rhine and Danube. Palestine, however, for some time continued to be a national centre through its schools of religious science, which after the desolation of Jerusalem flourished at Jamnia, Lydda, Usha, Sephoris, Tiberias, and other places, principally under the lead of the presidents of the sanhedrim (patriarchs, *nesiim*) of the house of Hillel, of whom Gamaliel Hazaken (the Elder), his son Simeon, his grandson Gamaliel, and great-grandson Simeon, with their celebrated fellow *tanaim* (teachers or scholars) Johanan ben Zakkay, Eliezer, Joshua, Eleazar, Ishmael, Tarphon, the great Akiba, and others, had been successfully active during the previous disastrous period. The succeeding rabbis (*rabbi*, my master), Ben Azay, Ben Zoma, the 5 pupils of Akiba, Eliezer, Meir, Jose, Jehudah, Simeon, Nathan, and others, continued their work by public teaching, as well as by collecting, elucidating, systematizing, and further developing the decisions (*halakhoth*, collectively termed *Halakkah*) of the oral law, which was finally converted into a written code or compendium of teachings (*Mishna*) by the patriarch Jehudah the Holy and his school, during the mild reign of the Antonines. To this were added the partly supplementary, partly explanatory works, *Tosefta*, *Mekhilta*, *Safra*, and *Sifre*. These works became the basis of religious study in the subsequent 3 centuries, in Palestine, as well as in Babylonia, where the schools of Sura, Pumbeditha, Nehardea, and others, flourished under more favorable circumstances, the most renowned teachers (in this period *amoraim*) of both countries being Rab, Samuel, Joshua ben Levi, Johanan, Simeon ben Lakish, the patriarch Jehudah II., Ame, Ase, Abahu, Eleazar, Jehudah, Hunna, Hisha, Nahman, Rabbah, Joseph, Zera, Jeremiah, Abbayi, Raba, Pappa, Ashe, Abina, and Mar bar (ben) Ashe (died 467). After new persecutions by the Christian emperors, which destroyed the schools (353) and the patriarchate (429) of Palestine, and by the Persian kings Yezdegerd II., Hormuz, Firuz, and Kobad in the latter part of the 5th century,

which destroyed the schools of Babylonia, the results of those studies were also collected, though in chaotic disorder, in the two Gemaras or Talmuds (literally, studies), the Palestinian and Babylonian. Other extant products of the time of the *tanaim* and *amoraim* were various ethical treatises (*Derekh eretz*, *Aboth*, &c.), historical, legendary, and cosmogonical writings (*haggadoth*, stories, collectively *Haggadah*, a vast branch), prayers (*tefilloth*), additions to the Chaldee paraphrase (*Targum*) of scriptural books, a new calendar, admirably adapted to the religious duties of the people, by Hillel (340), and some Greek fragments by Aquila and Symmachus. The Chaldee, often with an admixture of Hebrew, was now generally used in literary works, while the people used the various languages of the countries in which they lived. More and more oppressed and degraded by the emperors, of whom only Julian was favorable to his Jewish subjects, and who even attempted to rebuild the temple of Zion, and by the decrees of the councils, the Jews of Palestine once more hoped to recover their independence when they assisted the Persians in conquering Jerusalem (610), but were soon severely chastised for their rash attempt by the victorious emperor Heraclius. But a new power springing from the Arabian desert was destined to humiliate all the contending parties and sects between the Tigris and the Nile, the Byzantine emperors and the Sassanide shahs, Christians, fire worshippers, and Jews. A new Semitic prophet arose in the vicinity of the Red sea, teaching his disciples and people a monotheism which was to be carried triumphantly over a great part of Asia, Africa, and Europe (622). Mohammed himself after a long struggle conquered the castles of the independent Jews in Arabia, who, living from a very remote period in that country, were masters both of the poetical tongue and the sword of the desert, their warlike Samuel ben Abdiah, among others, being one of the most distinguished early poets of the peninsula. Omar and his generals conquered Jerusalem, Tiberias, Damascus, Antioch, and Alexandria from the Byzantines, and subdued Persia, thus bringing most of the eastern Jews under the rule of Islam. This proving comparatively mild, and the later caliphs favoring every science, Jewish studies revived, especially in Babylonia, where the Jews lived under the immediate rule of a prince of the captivity (*resh gelutha*), and where their great schools, having been reorganized under the *seboraim* (thinkers), were made flourishing under the *geonim* (the eminent), of whom Saadia (died 941), the translator of the Pentateuch into Arabic, and Hai (died 1037), the son of Sherira, and son-in-law of Samuel ben Hofni, are eminent as theological writers, poets, and linguists. Numerous works of *Haggadah*, now mostly known as *midrashim*, and ethical writings, were composed; the critical notes of the Masora and the "Targum of Jerusalem" elaborated; the admirable system of scriptural vocalization introduced; talmudical compendiums

written; medical, astronomical, and linguistic studies, and also cosmogonical speculations (*cabala*), pursued. An anti-rabbinical sect, beside the extinct Sadducees, the only one which deserves that appellation, was founded about the middle of the 8th century by Anan in Babylonia, receiving from their strict adherence to the letter of the Bible the name of Caraites (Scripturists). Their scholars, Salmon, Jeshua, and Jefeth, flourished in the 10th century. Scientific pursuits also spread among the Jews in Africa, who with slight interruptions enjoyed peace under the Saracenic princes; and among the theological writers of Fez and Kairouan in that period, of whom Nissim and Hanan (both in the 1st half of the 11th century) are the most celebrated, we find the physician and critic Isaac ben Soleyman, the lexicographer Hefetz, and the grammarians Ben Koraish, Dunash, and Hayug. The Arabic was generally used by the scholars.—The political and intellectual condition of the Jews was worse in the Byzantine empire and in the feudal states which arose on the ruins of the western. Deprived of most civil rights, they were now and then bloodily persecuted, as by the Franks and Visigoths in the 6th and 7th centuries, by the Byzantines in the 8th, when many of them fled and even spread their religion among the Khazars about the Caspian sea, and again in the 11th, about which time they appear in Russia, though only for a short time, and in Hungary. More tolerable, however, was their situation in Italy, Sicily, and Sardinia, where they often found protection through the influence of the popes. Bari and Otranto became the principal seats of Jewish learning. The renowned Eleazar ben Kalir and other writers of *piyutim* (liturgical songs in Hebrew rhymed verse), the historian Josipon, and the astronomer Shabthay Donolo, flourished in Italy in the 9th and 10th centuries, and the lexicographer Nathan in the 11th. From Italy science spread to the cities on the Rhine, to Lorraine and France. In the 11th and 12th centuries we find in Germany Simeon, the author of the talmudical *Yalkut* ("Gleaning Bag"), the poet Samuel the Pious, and the writer of travels Petahiah; in northern France, Gerson, surnamed the "light of the exiled," the liturgical poet Joseph Tob Elem, the renowned commentators Solomon Isaaki and his grandson Solomon ben Meir, and the authors of the talmudical *Tosafoth* ("Additions"), Isaac ben Asher, Jacob ben Meir, &c. Spain, after the conquest by the Saracens, who carried thither culture, science, and poetry, was destined to develop the most prosperous and flourishing condition which the Jews enjoyed in the middle ages. Persecutions became rare and exceptional. The Jews enjoyed civil rights and rose to high dignities in the state under the Moorish princes, and were almost as well treated by the Christian monarchs, and their culture and progress in science not only kept pace with their prosperity, but also outlived occasional adversity. In the 10th century we see there the lexicographer

Menahem, the astronomer Hassan, and the rich, liberal, and scientific Hasdai, the friend and physician of the caliph Abderrahman III., at Cordova; in the 11th the talmudical scholars Samuel Hallevi and Isaac Alfi (of Fez), the grammarian Abulwalid, the philosopher David Mokahez, the ethical writer Behay, and Solomon Gabirol, equally celebrated as Hebrew poet and Arabic philosopher; in the 12th the theologian Abraham ben David, the astronomer and geographer Abraham ben Hiya, the poet Moses ben Ezra, the traveller Benjamin of Tudela, the scientific poet Jehndah Hallevi, whose glowing songs rival the beauties and purity of the Psalms, the great critic, philosopher, and poet Aben Ezra, and finally Moses Maimonides, who as a philosopher, as well as writer on the law, by far surpassed all his contemporaries. The diffusion of science among the Jews now attained its height in Europe, as well as in Egypt, whither Maimonides fled after a persecution at Cordova (1157), and where he and his son Abraham officiated as physicians to the court of the sultan. Spain numbered among its vast number of scholars in the 13th, 14th, and 15th centuries, the poets Charizi, the Hebrew imitator of the Arabian Hariri, and Sahola; the astronomers Aben Sid, the author of the Alfonsine tables, Israeli, and Alhadev; the philosophical theologians Palquera, Lattef, Caspi, Hasdai, Albo, and Shemtob; the celebrated commentators Nahmanides, Addereth, Gerundi, Behay, Yomtob, and Nissim; the cabalists Todros, Gecatilia, Abelaia, and De Leon. In Provence and Languedoc, where high schools flourished in Lunel, Nîmes, Narbonne, Montpellier, and Marseilles, from the 12th to the 15th century, we find the 3 grammarians Kimhi and their follower Ephodi; the poets Ezobi, Jedaiah, and Calonymus; the commentators Zerachiah Hallevi, Abraham ben David, and Menahem ben Solomon; the philosophers Levi ben Abraham, Levi ben Gerson, and Vidal; the 4 Tibbons, all translators from Arabic into Hebrew, and the lexicographer Isaac Nathan. Italy had in the 13th, 14th, and 15th centuries the poets Immanuel, an imitator of Dante, Moses de Rieti, and Messir Leon; the talmudists Trani and Colon; the cabalist Recanate; the astronomer Immanuel; various grammarians and translators from Arabic and Latin; and finally the philosopher Elias del Medigo. Germany had in the same period the talmudists Meir, Mordecai, Asher and his son Jacob, and Isserlin, the cabalist Eleazar, and others. The Caraites, too, had a number of scholars, as Hadassi, the two Aarons, and others. During the earlier part of this long period of literary activity in the West the Jews enjoyed peace and prosperity, with various interruptions, in Spain, Portugal, Italy, Greece, the islands of the Mediterranean, in Hungary, especially under the national kings, and in Poland, which hospitably received the numerous exiles from all neighboring countries, under the Piasts, particularly the last of them, Casimir the Great; but there

were none in Muscovy and in the Scandinavian states; and in England, where they appear before the time of Alfred, in France, where only the early Carolingians, and especially Charlemagne, favored them, and throughout Germany, their condition was in the last degree deplorable. Circumscribed in their rights by decrees and laws of the ecclesiastical as well as civil power, excluded from all honorable occupations, driven from place to place, from province to province, compelled to subsist almost exclusively by mercantile occupations and usury, overtaxed and degraded in the cities, kept in narrow quarters and marked in their dress with signs of contempt, plundered by lawless barons and penniless princes, an easy prey to all parties during the civil feuds, again and again robbed of their pecuniary claims, owned and sold as serfs (*Kammerknechte*) by the emperors, butchered by mobs and revolted peasants, chased by the monks, burned in thousands by the crusaders, who also burned their brethren of Jerusalem in their synagogue, tormented by ridicule, abusive sermons, monstrous accusations and trials, threats and experiments of conversion, the Jews of those countries offer in their mediæval history a frightful picture of horrors and gloom. In England they had their worst days in the reigns of Richard I., at whose coronation they were frightfully massacred at York (1189), John, Henry III., and Edward I., who expelled them altogether from the realm (1290). From France they were for the last time banished under Charles VI. (1395). Germany, where the greatest anarchy prevailed, was the scene of their bloodiest persecutions, the most frightful of which took place in the cities on the Rhine during the great desolation by the black plague, which depopulated Europe from the Volga to the Atlantic (1348-'50). Pointed out to the ignorant people as having caused the pestilence by poisoning the wells, the Jews were burned by thousands on the public squares, or burned themselves with their families in the synagogues. Almost every imperial city had a general persecution of the Jews. The Swiss towns imitated their neighbors, almost all banishing their Jews. With the growing influence of the inquisition the Jews of southern Europe, too, suffered the same fate. The protection of the popes being gradually withdrawn, they were banished from the cities of Italy into separate quarters (*ghetti*), and obliged to wear distinctive badges; persecutions became more frequent; in 1493 all the Jews of Sicily, about 20,000 families, were banished. In Spain, during a long drought in 1391-'2, the Jewish inhabitants were massacred in many cities. The condition of the Jews grew worse in the following century, until their extirpation from the whole country was determined upon, and, after repeated but fruitless attempts at conversion by the stake, finally carried into effect by Ferdinand and Isabella (1492). More than 70,000 families sought refuge in Portugal, where for a large sum of money the fugitives were allowed

to remain for a few months, in Africa, Italy, Turkey, and other countries. Not the 5th part of them survived the horrors of compulsory expatriation, shipwreck, and subsequent famine. The feeling observer may find a compensation in the fact that while these events happened propitious winds carried three small caravels across the Atlantic to a new world, whose enervating treasures were destined to assist the inquisition in undermining the power of the oppressors, and whose future institutions were to inaugurate an era of freedom to the descendants of the oppressed. The Jews of Portugal were banished soon after (1495) by King Emanuel, being robbed of their children under 14 years of age, who were sent to distant islands to be brought up as Christians. The numerous converted Jews of the peninsula and their descendants were still persecuted for more than two centuries by governments, inquisitors, and mobs. These persecutions, which eventually carried the bulk of the European Jewish population into the provinces of Poland and Turkey, similar events in the East during the crusades, a long series of persecutions in Germany, and in central and southern Italy in the 16th century, and bloody massacres by the revolted Cossacks under Chmielnicki in the S. E. regions of Poland, together with a general and minutely developed system of petty oppression, extortion, and degradation, to which the Jews were subjected in most parts of Europe during the 250 years following their expulsion from the Iberian peninsula, could not but exercise a disastrous influence upon the culture and literature of the people. The spirit of cheerful inquiry, study, and poetry which distinguished the Spanish-Provençal period, was gone. The critical knowledge and use of the Hebrew was neglected, the study of the Talmud and its commentaries became the almost exclusive occupation of the literary youth, and cabalistic speculations replaced philosophy, producing in Poland various schools of religious enthusiasts called *Hasidim* (pietists). A bold Turkish Jew, Shabthay Tzebi, who, like the Persian Aldaud or Aloy in the 12th century, was proclaimed by his cabalistic followers the expected Messiah of Israel, found numerous adherents even in various parts of Europe (1666), whose delusion was destroyed only by his compulsory conversion to Mohammedanism. Literature and science, however, still found scattered votaries, especially in northern Italy, Turkey, and Holland; and beside the great talmudists, theologians, or commentators of this period, Don I. Abarbanel, I. Arama, J. and L. Habib, Mizrahi, O. Bartenura, O. Sforno, I. Luria, T. Karo, the author of the talmudical abridgment or code *Shulthan arukh*, E. Ashkenazi, Alsheikh, S. Luria, M. Isserels, M. Jafeh, Sirks, S. Cohen, Lion of Prague, E. Lentshitz, J. Trani, J. Hurwitz, H. Vital, S. Edels, Y. Heller, Shabthay Cohen, A. Able, D. Oppenheimer, the collector of the best Hebrew library (now in Oxford), Tzebi Ashkenazi, H. Silva, J. Rosanis,

D. Fränkel, J. Eybeschütz, J. Emden, H. Landau, Elias of Wilna, &c., we find the philosophers and men of science Bibago, S. Cohen, Amatus, Almosnino, De Castro, A. Zachuto, J. del Medigo, M. Hefetz, and Nieto; and among the poets, grammarians, critics, lexicographers, and historical writers, De Balmes, Elias Levita, A. Farissol, Solomon ben Melekh, Jacob ben Hayim, Gedaliah Jaliah, A. de Rossi, De' Pomi, D. Gans, S. Arkevolte, Lonsano, Manasseh ben Israel, the defender of the Jews before Cromwell, S. Norzi, S. Luzzato, Leo de Modena, S. Mortera, J. Orobio, Shabthay ben Joseph, B. Mussaphia, De Lara, J. Cardoso, J. Abendana, S. Hanau, M. H. Luzzato, J. Heilprin, Azulai, and others. Beyond the limits of the Turkish empire there was scarcely any trace of Jewish literature in the East, though there were and are still numerous Jewish communities in Persia, northern Arabia, Independent Tartary, and Afghanistan, as well as scattered colonies, mostly of more or less mixed race and religion, in India, China, Cochin China, Yemen, Abyssinia, and other parts of Africa, partly of very ancient date, partly founded by escaped Portuguese and Spanish New Christians, some of whom also settled in parts of Brazil and Guiana during the occupation by the Dutch. In Europe the last of the three great religious struggles, against paganism, against Mohammedanism, and between the contending Christian sects, all of which were destructive to the Jews, was terminated by the peace of Westphalia (1648). Catholicism was triumphant in the south and in France, Protestantism in the north and north-west. The greater persecutions of the Jews now ceased. They became flourishing in the republics of Holland and Venice and their dependencies, were readmitted into England by Cromwell (having also entered Denmark and returned into France), spread with the Dutch and English to various parts of America, reentered Russia under Peter the Great (to be expelled afterward), were admitted in Sweden, and were protected and often employed in high stations by the sultans of Turkey and Morocco. In Germany and Switzerland, where the struggle was not terminated by any decisive triumphs, the mediæval treatment of the Jews was continued longest, its worst features being maintained and developed in Austria (excepting in the reign of Joseph II.), where down to the revolution of 1848 the Jews were excluded from all civil rights, numerous professions, and various provinces, districts, towns, villages, and streets, paying beside a tax for toleration in Hungary, in spite of the remonstrances of the legislatures, a tax upon their sabbath lights in Galicia, and a residence tax when visiting Vienna; while their houses in Moravia were often searched in the night of the sabbath for the purpose of surprising the returned Jewish peddlers who had been secretly married before the extinction of all older brothers, which was prohibited by a Pharaonic law. The general progress of freedom was promoted in the age of philosophy by the appearance of Spinoza and

Mendelssohn (1729-'86) among this long despised people. The influence of the latter upon Jews and Christians through his works, example, fame, and friends (the great Hebrew poet Wessely, Euchel, Löwe, Friedländer, &c., among Jews, and Lessing, Dohm, Abt, Nicolai, Engel, Ramler, &c., among Christians), was immense; and his admirers could say: "Between Moses (the lawgiver) and Moses (Mendelssohn) there was only one Moses (Maimonides)." Progress now became general among the Jews, and the noble philosopher lived to see the first dawn of freedom in the land of Franklin and Jefferson. The great revolution in that of Voltaire and Rousseau came next, and the triumphs of republican and imperial France destroyed the mediæval institutions on the Rhine and Po. Liberty, crushed in Poland by the Russians, when 500 of Kosciuszko's Jewish volunteers fell fighting to the last on the ramparts of Praga (1794), was successively victorious in the West. Proclaimed in the United States and France, the rights of the Jews were recognized in Holland, Belgium, Denmark, parts of Germany, Canada, and Jamaica; in 1848-'9 throughout Germany, Italy, and Hungary; and finally in Norway and England. Among the most zealous defenders of the rights of the Jews were the Frenchman Grégoire, the Pole Czacki, the German Welcker, the Irishman O'Connell, the Englishman Lord John Russell, the Italian D'Azeglio, and the Hungarian Eötvös, all Christians; the Jews by descent Börne and Disraeli, and the professing Jews Jacobssohn, Tugendhold, Riesser, Philipssöhn, Montefiore, and Crémieux. The revolutionary movement of 1848-'9 proved the immense progress of the Jews as well as of public opinion since Mendelssohn and Lessing. The Jews Crémieux, Goudchaux, and Fould (now minister of state) were among the ministers of the French republic; Pincherle was a member of the provisional government in Venice; Jacobi of Königsberg was the leader of the opposition in the Berlin parliament; Riesser was vice-president of that of Frankfurt; Dr. Fischhof stood at the head of affairs in Vienna after the flight of the court; Meisels, the rabbi of Cracow, was elected to the Austrian diet by Polish patriots; and Hungarian barons and counts willingly fought under Jewish officers of higher rank, of whom the adjutant of Gen. Nagy-Sándor, Freund, afterward became Mahmoud Pasha during the war in Turkey. The subsequent reaction, as in Austria, where it was checked by the events of 1859, was mostly temporary, and the Mortara case in Italy in 1858 has excited a very general expression of opposition to the antique legislation by which it was decided. Of the vast number of Jewish writers after Mendelssohn we mention only a few: the talmudists Jacob of Dubno, Jacob of Slonim, Pick, Jacob of Lissa, Bonet, Eger, Sofer, Chajes; the Hebrew poets, philologists, or critics, E. Luzzato, S. Cohen, Satanow, Wolfsohn, Bensev, Pappenheim, Tropowitz, Heidenheim, Löwisohn, S. Bloch, Simha of Ilrubeszow, Jettles, Landau, Reggio, Perl, N. Krochmal,

the great rabbinical critic Rapoport, S. D. Luzzatto, Letteris, Eichbaum, P. M. Heilprin, S. Sachs, Kirchheim, Schorr, A. Krochmal; the historians, critics, or publicists on Jewish subjects in modern languages, Zunz, Jost, Riesser, Geiger, Fürst, Philippon, Salvador, Munk, Cohen, Dukes, Frankel, M. Sachs, Jelinek, Herzfeld, Saalschütz, Steinschneider, Grätz, Löw, Raphael (New York), Leeser (Philadelphia), Wise (Cincinnati); the conservative theologians Plessner, Johlsohn, Steinheim, and Hirsch; the advocates of religious reform (beside Geiger and Herzfeld) Chorin, Creizenach, Stein, Horxheimer, Holdheim, Hess, Stern, Einhorn (Baltimore), Lilienthal (Cincinnati); the pulpit orators Mannheimer, Kley, Salomon, Frankfurter; the philosophers Maimon, Bendavid, Frank; the mathematicians Witzenhause, Sklow, A. Stern; the astronomers W. Beer, Stern, Slonimski; the ichthyologist Bloch; the physiologist Valentin; the anatomist Hirschfeld; the poets Kuh, M. Beer, Frankl, Léon Halévy; the miscellaneous writers Auerbach, M. M. Noah, Grace Aguilar, Jules Janin; the orientlists Weil, Dernburg, Oppert (beside Munk). Politics, law, medicine, and the arts, including the stage (Mlle. Rachel, &c.), have had numerous representatives, and especially music (Meyerbeer, Halévy, Herz, &c.).—The number of Jews in all parts of the world is hardly less than 4,500,000, or more than 6,000,000.—The HEBREW LANGUAGE (Heb. *ibrith*, or *lashon ibrith*, Hebrew tongue, also *leshon hakkodesh*, sacred tongue, in post-biblical Jewish works; *yehudith*, Jewish, in the biblical history of the period following the captivity of the 10 tribes; in Isaiah, poetically, also *sefath kenaan*, language of Canaan), together with scanty remnants of the Phœnician and Punic, belongs to the so called Canaanitic branch or chief division of the Semitic family of languages, the other branches being the Aramaic and Arabian. In the antiquity of its extant literary remnants the Hebrew by far surpasses all other Semitic idioms, and in richness and development exceeds all others except the Arabic. The Hebrew is deficient in grammatical technicalities, especially in moods and tenses of the verb, and consequently also somewhat in precision; but in euphony, simplicity, brevity, variety of signification, and power of poetical expression, it is hardly excelled by any tongue. In its full purity the Hebrew appears in the earlier books of the Bible, in the mediæval poetical works of R. Jehudah Hallevi, Aben Ezra, &c., and in the modern poems of Wessely, S. Cohen, and others. The prose writings posterior to the Babylonish captivity are generally tinged with Aramaisms, especially the *Mishna*, which also contains numerous Greek words, while the mixed idiom of the *Gemara* and its commentaries may be termed Chaldaic rather than Hebrew. In the middle ages pure Hebrew was used only in poetical prose; in modern times it is used exceptionally in simple prose. In the East and in Poland the Hebrew is often

used in correspondence, in the East occasionally also as a medium of conversation with occidental Jews. Of the various modes of Hebrew pronunciation the *sefaradic* (improperly Portuguese), or that of the descendants of the exiles from Spain and Portugal, is regarded by scholars as the most genuine. There are three kinds of Hebrew alphabets now in use: the square, also called the Assyrian (properly Babylonian), which is generally supposed to have been introduced by Ezra, the most common in print; the rabbinical or mediæval, used chiefly in commentaries and notes; and the cursive, in writing. The most ancient Hebrew, however, is believed by many critics more to have resembled the Phœnician, and to be best represented by the Maccabean coins and the alphabet of the Samaritan version of the Pentateuch. The writing is from right to left. The alphabet consists of 22 letters or consonants, the vowels being expressed by marks above or below the letters. Five letters have a separate final form. There are no capital letters. The accents and marks of punctuation are very numerous. The following examples will exhibit some of the most interesting features of the language: *Kol*, (a) voice, *hakkol*, the voice; *gan*, garden, *haggan*, the garden; *shem*, name, *hashshem*, the name. *Dod*, uncle, *dodah*, aunt; *dod zaken*, an old uncle, *dodah zekenah*, an old aunt; *dodim zekenim*, old uncles, *dodoth zekenoth*, old aunts; *sheney dodim*, two uncles, *shetey dodoth*, two aunts. *Oznayim*, *raglayim*, *alpayim*, two (a couple of) ears, feet, thousands. *Banim*, sons, *banoth*, daughters; *beney david*, *benoth david*, sons, daughters of David. *Ani* (ee) *gadol*, I am great, *hu* (oo) *gadol*, he is great, *hem gedolim*, they are great. *Koli* (ee), my voice, *kolo*, his voice, *kolam*, their voice. *Lemosheh*, to Moses, *bemosheh*, in Moses, *kemosheh*, like Moses, *midavid*, from David. *Bo*, in him, *lo*, to him; *banu*, in us, *lanu*, to us. *Beyn*, between; *beyn moshch vedavid*, between Moses and David; *beyni ubeyno*, between me and him. *Min*, from; *gadol middavid*, greater than David. *Golyath raah eth david*, Goliath saw (looked at) David; *golyath heref eth david*, Goliath insulted (mocked at) David; *david hikkah eth golyath*, David struck (at) Goliath. *Shamor*, to guard; *eshmor*, I shall guard, *tishmor*, thou wilt guard, *nishmor*, we shall guard; *shamarti*, I (have) guarded, *shamarnu*, we guarded, *shemartem*, ye guarded; *ani shomer*, (I am guarding) I guard, *hu shomer*, he guards, *hem shomerim*, they guard; *shamar*, (he) guarded, *nishmar*, was guarded, *hishtammer*, guarded himself; *tishmor*, to guard, *bishmor*, in guarding, *nishmor*, from guarding; *mosheh shamar*, Moses guarded; *miryum shamara*, Miriam guarded. Among the eminent modern Christian writers (the Jewish being mentioned in the literary parts of this article) on Hebrew history, literature, or language are Reuchlin, the two Buxtorfs, Lowth, Basnage, Michaelis, Eichhorn, Herder, Rosenmüller, Jahn, Gesenius, De Wette, Ewald, Quatremère, Milman, Robinson, Noyes, Stuart, Bush, and Renan.

HEBRIDES, or WESTERN ISLANDS (the *Ēbūdæ* of Ptolemy, and the 30 *Hebudes* of Pliny), a group of islands, about 200 in number, off the W. coast of Scotland, between lat. 55° 26' and 58° 32' N., and long. 5° and 8° W. They are usually classed as the outer and inner Hebrides. The outer include the islands of Lewis and Harris, N. Uist, Benbecula, S. Uist, and Barra, lying in a continuous chain extending 130 m. from the Butt of Lewis on the N. to Barra Head on the S. The inner Hebrides are more irregularly disposed at intervals of 10 to 30 m. apart, and comprise 7 islands in the frith of Clyde, which form the county of Bute, 16, beside some islets, belonging to Argyshire, and 7 to Inverness-shire. Of the whole number only 180 can properly be called islands, the rest being mere rocks in the ocean. Only 79 are permanently settled; 20 or 30 more are occupied during the season of pasture with flocks. The total area of the islands is 2,739 sq. m., or 1,688,960 acres, of which 170,000 are arable, 700,000 hill pasture, and 64,000 in lakes. Their population in 1851 was 116,367. The largest islands are Lewis, Skye, N. Uist, S. Uist, Benbecula, Mull, Islay, Arran, and Jura. The geological formation of the outer Hebrides and of one or two others is gneiss; the rest may be divided into the trap, the slate, and the trap, sandstone, and limestone islands. The soil of those of gneiss formation is poor, with a large proportion of peat moss; the others are more fertile, especially the islands of the frith of Clyde. Arran, Jura, Mull, and Skye have mountains 2,000 to 3,000 feet in height; others have no hills higher than 1,500 feet, while Tyree and the southern isles of the outer group have no ground higher than 300 feet. The islands bear the appearance of having at one period formed a portion of the mainland of Scotland. The channel which separates them from the mainland is called the Minch. Their coasts, especially fronting the Atlantic, are bold and rocky, indented with numerous bays. There are many lakes, of an average depth of 3 or 4 fathoms. The climate is mild and moist, with occasional storms of great violence. In the uplands 30 to 36 inches of rain fall annually; on the coast about 25 inches. The temperature is rarely lower than 5° below the freezing point. Storms from the S. W. are prevalent from August to March, accompanied by heavy rains. Winter may be said to last from October till the beginning of April. Marble, limestone, and slate are quarried, the latter in considerable quantity. Iron ore is abundant in most of the islands, some copper is found, and lead is worked in Islay to a small extent. Coal exists, but is not available; the fuel used is peat. There is little wood on any of the islands, and on many none, although some centuries since they were mostly clothed with forests. Extensive plantations have, however, been made with success in Skye, Islay, and Mull. Agriculture is in a very backward condition. Oats, barley, and potatoes are the staple crops. Nothing is

grown for export, and in unproductive seasons the harvest is not sufficient for the consumption of the inhabitants. Famine has more than once visited these islands. In 1846 the destitution was so great that an appeal was made to the charity of the British people. The tenure of land is very unfavorable to enterprise. Much of the soil is held by tacksmen, an intermediate class between the proprietors and the cultivators. Many of the tenants hold their farms at will, or on very short leases, and sublet on the same terms to cottiers and crofters. Excepting in localities where the population has been thinned to make large holdings, the farms are generally small, renting at from £5 to £50 each. In Islay and some of the larger islands the system is better, and leases of 19 years are granted as in other parts of Britain. Want of roads is a great drawback to their prosperity. In most of the islands the dwellings are wholly clustered along the coast, leaving the interior country unsettled. The raising of black cattle is the staple industry. These cattle, called kyloes, are exported in a lean condition to the richer pastures of the mainland, where they rapidly increase in weight. The stock of them in the islands is estimated at 120,000. Native sheep are very diminutive, not weighing more than 20 lbs., but the Cheviot breed has been introduced in some localities. The horses are small and hardy, and are exported, but are not so handsome as the ponies of Shetland. Kelp is still manufactured to the extent of 5,000 tons per annum, from the seaweed thrown by storms on the beach, but it is less profitable than if the raw material were used as manure. (See KELP.) Yarn spinning, which was formerly an industrial occupation in Islay, has been quite destroyed by the Glasgow factories. There are two cotton mills in operation in Rothesay, but they may be rather considered as belonging to Glasgow than the Hebrides. Islay contains whiskey distilleries producing about 250,000 gallons annually. The islanders receive a considerable amount of money from the expenditures of tourists. Steamers ply regularly during the summer among the islands, and thousands of strangers visit Staffa, Iona, and Arran. Staffa contains the celebrated Fingal's cave. (See STAFFA.) The Hebrides form 30 parishes, containing 42 parochial and 149 non-parochial schools, attended by one tenth of the population, yet an equal number over 6 years of age are totally without education. There are 56 churches, of which 44 are of the Church of Scotland, the majority of the others being Roman Catholic. Within the past few years the population of these islands has decreased in consequence of emigration, which in many instances has been encouraged by the proprietors, whose rental is increased by the change from small to large farms. Gaelic is still generally spoken by the people, but English is gradually superseding it. Both Gaelic and English are taught in the schools. The principal villages are Stornoway in the island of Lewis,

Portree in Skye, Torosay in Mull, Rothsay in Bute, and Lamblash in Arran. Few antiquities are found in the Hebrides excepting in Iona, which contains the reputed burial places of 48 Scottish, 16 Norwegian, 1 French, and 4 Irish kings, among ecclesiastical ruins of various periods since 563, when tradition says St. Columba introduced Christianity. There were 5 other monastic stations in the Hebrides, at Oronsay, Colonsay, Crunsay, Lewis, and Harris; but few vestiges remain.—These islands were at first under their own chieftains; then subject to the kings of Norway, until 1264, when they were annexed to the kingdom of Scotland, but their chieftains paid only a nominal obedience. In 1346 the minor chiefs fell under the sway of one McDonald, who took the title of lord of the isles and affected independence. In 1715 and 1745 the islands mainly declared in favor of the Stuarts, and after the defeat at Culloden sheltered the pretender until his escape to France. The act of parliament of 1748 abolishing heritable jurisdictions gave the finishing blow to the independence of the chieftains of the Western Isles.

HEBRON (Arab. *El Khaleel*; anc. *Kirjath Arba*), a city of Palestine, in the pashalic of Damascus, 18 m. S. from Jerusalem; pop. variously estimated at from 5,000 to 10,000. It stands partly on the declivities of two hills, and partly in the deep and narrow valley of Mamre. The streets are narrow, tortuous, and dirty, and the houses, which are built of square rough stones, are high and gloomy, with flat or hemispherical roofs. At the S. extremity of the town is a mosque, formerly a Greek church, which, according to the Mohammedans, covers the cave of Machpelah, and the sepulchre of the patriarchs Abraham, Isaac, and Jacob. The other principal edifices are the citadel, 8 mosques, 2 synagogues, and several schools and bazaars. Hebron is one of the oldest of existing cities, having been founded by Arba, the father of Anak and the Anakim. It was a favorite abode of the patriarch Abraham, and the residence of King David during the early part of his reign. The Arabic name means "The Friend" (*i. e.*, of God), by which epithet the Arabs designate Abraham. In 1834, as a consequence of the rebellion and defeat of its inhabitants, it was stormed and plundered by Ibrahim Pasha. In 1837 Hebron suffered much from earthquakes, but the town has since been more fortunate, and Lord Lindsay, in his "Letters on Egypt, Edom, and the Holy Land" (5th ed., London, 1858), describes its condition as improving.

HEBRUS, in ancient geography, a river of Thrace. See MARITZA.

HECATEUS, a Greek historian and geographer, born in Miletus about 550 B. C., died about 476. He visited various provinces of the Persian empire, Egypt, Libya, Greece, Italy, and other countries. On his return home he found his fellow citizens of Miletus, and the Ionians generally, meditating a revolt against

Persia. Hecateus vainly endeavored to dissuade them therefrom; the contemplated revolt was carried out, and ultimately led to that war which demonstrated the superiority of Europe over Asia. After the suppression of the revolt, Hecateus, still high in the esteem of his countrymen, though hostile to their proceedings, was sent as ambassador to the satrap of the great king to solicit mercy for the vanquished. He succeeded in his mission, and averted from the Ionians the vengeance of the conqueror. He was the author of a geographical work entitled *Περιοδος Γης*, or *Περιηγησις*, and of a historical one entitled *Γενεαλογιαι*, or *Ιστοριαι*. The former contained a description of various countries in Europe, Asia, and Africa; the latter was a prose account of the mythical history of the Greeks. Some fragments of these works are extant, and were published by R. H. Klausen at Berlin in 1831.

HECATE, a divinity of ancient Greece, who was commonly called a daughter of Perses or Persæus and Asteria. She had dominion in heaven, on earth, and in the sea, and could bestow on mortals wealth, victory, and wisdom. This extensive jurisdiction caused her to be confounded with Ceres, Rhea, Diana, and Proserpine. She was worshipped in Samothrace and Ægina, and at Athens, where small statues of Hecate were placed in front of houses and at cross roads. Her favorite sacrifices were dogs, honey, and black ewe lambs. In works of art she is sometimes represented as a single being, sometimes as a 3-headed monster.

HECATOMB (Gr. *έκατον*, 100, and *βους*, ox), literally a sacrifice of 100 oxen; but even so early as Homer's age the term had lost its literal signification, and was employed to denote any great public sacrifice. Thus we read in the Iliad of hecatombs of 12 oxen, of hecatombs of oxen and rams, and of hecatombs composed solely of rams.

HECKER, FRIEDRICH KARL FRANZ, a German politician, born in Eichtersheim, Baden, Sept. 28, 1811. He practised law in Mannheim from 1833 until elected to the second chamber of Baden in 1842. He was distinguished for extreme radicalism, and in 1845 travelled with Itzstein for the purpose of disseminating his views. At Berlin they received an order to leave Prussia in 24 hours. In the diet of 1846–7 Hecker even opposed the liberal ministry of Bekk, and voted against taxation; but not being sustained, he resigned his seat in March, 1847. He shortly after availed himself of a fusion between the democrats and liberals to enter the assembly again. Having allied himself with the republican and socialist Struve, and taken an active part in a meeting at Offenbourg (Sept. 12, 1847), where the radical programme was drawn up, he was about to be tried for treason, but was allowed to retain his place in the chamber, where he continued to be the leader of the extreme left. He was a member of the provisional Frankfort parliament, but as his party was here left in the minority, he took

part with Struve in the insurrection of April in the south of Baden, and fled after their defeat at Kandern into Switzerland, where he established a radical journal, the *Volksfreund*. In Sept. 1848, he emigrated to America, but was recalled by the provisional government of Baden in 1849. In July he arrived in Strasbourg, but, finding that the revolutionary party had been completely defeated, returned to the United States, where he now resides as a farmer in Belleville, Ill. In 1856 he took an active part in American politics by delivering public speeches in various parts of the Union in favor of the republican party.

HECKER, ISAAC THOMAS, an American clergyman, born in New York, Dec. 18, 1819. He received his education in his native city, and entered into business there with his brothers in the well known milling and baking establishment of Hecker and brothers. He passed the summer of 1843 with the association for agriculture and education at Brook Farm, in West Roxbury, Mass., and subsequently spent some time with the community known as the "Conscience Family," established on a somewhat similar plan at a spot called Fruitlands in Worcester co., Mass., about 40 m. from Boston. He returned thence to New York, and in 1845 was received into the Roman Catholic church. Soon after taking this step he determined on entering the congregation of the Most Holy Redeemer, and, after making his novitiate at St. Trond in Belgium, was admitted to the order in 1847. On the completion of his ecclesiastical studies he was sent by his superiors to England, and in 1849 was ordained priest in London by Cardinal Wiseman. He passed 2 years in England engaged in missions. In 1851 he returned to New York in company with several members of his order, and for the next 7 years was constantly employed in missionary labors in various parts of the United States. In 1857, having visited Rome, Mr. Hecker with some of his colleagues was released by the pope from his connection with the Redemptorists, and in 1858 he founded with his companions a new missionary society under the name of the congregation of St. Paul the Apostle. The first house of this community is now (Nov. 1859) building in New York city. Mr. Hecker is the author of "Questions of the Soul" (12mo., New York, 1855), and "Aspirations of Nature" (1857). While in Rome he published in the *Civiltà Cattolica* two papers on "Catholicity in the United States," which were translated into several languages and reprinted in America and in Europe.

HECKEWELDER, JOHN, a Moravian missionary, born in Bedford, England, March 12, 1743, died in Bethlehem, Penn., Jan. 21, 1823. At the age of 12 years he came with his father to Pennsylvania. He accompanied Mr. Post in 1762 in his expedition to the Indian tribes on the Ohio, and in 1771 he took up his residence among them as a missionary. After some 40 years' missionary service, he went to Bethlehem, 19 m. N. of Philadelphia, the prin-

cipal establishment of the Moravians in America, and there remained till his death. He wrote several memoirs upon the Delaware and Mohican Indians.

HECLA, MOUNT. See ICELAND.

HECTARE, a French measure of superficial extent, containing 100 *ares* and 10,000 square *mètres*, and equivalent to 2.47 acres.

HECTOGRAMME, in French weights, 100 grammes. The prefix *hecto* multiplies by 100 (Gr. *ἑκατον*) throughout the French system.

HECTOR, a Trojan hero, and the noblest character of the *Iliad*. He was the eldest son of Priam and Hecuba, the husband of Andromache, and the father of Astyanax. He disapproved of the conduct of Paris, and advised the surrender of Helen to Menelaus; but when his remonstrances and warnings were disregarded, he devoted all his energies to the service of his native city. After slaying some of the bravest warriors of the Hellenic host, and among them Patroclus, the friend of Achilles, he was at length vanquished and killed by the latter, who thrice dragged the corpse of the fallen champion round the walls of Troy; but afterward relenting, he restored it for a ransom to Priam, who consigned it to an honorable grave.

HECUBA, a daughter of Dymas in Phrygia, or of Cisseus, king of Thrace, 2d wife of Priam, king of Troy, and the mother of Hector, Paris, Cassandra, Creüsa, and 15 other children. According to Enripides, she was enslaved by the Greeks after the capture of Troy, and carried to Chersonesus, where she saw on the same day her daughter Polyxena sacrificed and the body of her youngest son Polydorus cast on the shore after he had been murdered by Polymestor, king of the Thracian Chersonesus. She determined on revenge, and, sending for Polymestor and his two sons, under pretence of wanting to inform them of hidden treasure, she slew the children on their arrival, and tore out the eyes of their father. According to other accounts she became the slave of Ulysses, and in despair killed herself by leaping into the sea.

HEDDING, ELIJAH, D.D., a bishop of the Methodist Episcopal church, born in Dutchess co., N. Y., Jan. 7, 1780, died in Poughkeepsie, April 9, 1852. At the age of 19 he entered the ministry, and was appointed to Essex circuit as the successor of the eccentric Lorenzo Dow. He extended his travels to Canada, and preached the gospel in various parts. He became a member of the New York annual conference in 1801, and was appointed to the Plattsburg circuit. For many years he was presiding elder of a district, and was elected delegate to the first delegated general conference of the church, which was held in New York in 1812, and at every subsequent meeting of the same he represented the conference to which he belonged until his election to the episcopate, which took place in 1824. He was mainly instrumental in the establishment of the "Zion's Herald" at Boston, the first journal published by the Methodist church in the United States; and no minister

in the church has labored more zealously and efficiently in promoting the cause of general and theological education than Bishop Hedding. In 1848 he was chosen by the general conference to represent the Methodist Episcopal church in the British conference. He wrote a manual on the discipline of the church, which is regarded generally as of high authority.

HEDENBORG, JAN, a Swedish traveller, born in 1787, was educated at the university of Upsal, and officiated as physician to the Swedish minister in Constantinople. He explored various countries in the East, and wrote *Turkiska Nationens Seder, Bruk, och Klädedrägter* ("Habits, Usages, and Customs of the Turkish People," Stockholm, 1839-'42, with 48 plates), and *Resa i Egypten och det inre Afrika* ("Journey in Egypt and the Interior of Africa," Stockholm, 1843).

HEDGE, a fence of stout bushes for protecting fields and gardens. Hedges are sometimes constructed of brushwood and lopped branches of trees, so firmly planted in the ground as to render it difficult to penetrate through them. In distinction from this sort, a fence of living shrubs planted when they are young, and trained and pruned so that they may yearly increase in thickness and strength, is termed a quick hedge. Hedges for actual use are of more importance in a country where wood or stone is not easily obtained than in the United States. In England, for instance, the system of hedges has prevailed to such an extent that much of the garden-like appearance of the cultivated portions of that country is owing to its hedge rows. It has been considered there that well managed hedges are the most effective fences, the cheapest and the most pleasing to the eye. In America the hedge is employed for ornament, and used principally for garden boundaries. The most attractive hedges are formed by using the buckthorn (*rhamnus catharticus*), which has close, slender stems, and deep green foliage. Such a hedge in a few years presents a most verdant appearance during the summer, and is free from the attacks of insects. This is owing to the medicinal quality of its leaves, bark, and stems, proving offensive to insects of every kind. The common hawthorn of Europe, and the more beautiful American thorns (*crataegus*), have been found unsuitable on account of their liability to the attacks of the apple-borer (*saperda vivittata*, Say), which destroyed entire rows of fine hedges in various parts of the country. The leaves of the buckthorn are green and shining, and in form somewhat like those of the common plum; the berries are of a shining black and abundant. Its roots consist of perfect masses of black, mat-like fibres, which spread freely beneath the surface of the earth, and attract ample means of sustenance from almost any kind of soil, whether dry or moist. The seeds should be sown in the autumn, and will readily vegetate during the succeeding spring. In 2 years the young plants are large enough for planting out. Many fine speci-

mens of buckthorn hedges are to be seen around Boston, Mass. In the middle and western states the Osage orange (*Maclura aurantiaca*, Nutt.) has been found to possess excellent qualities for hedges, being vigorous, robust, and long-lived. Its foliage is of a glossy light green color, its branches are set with numerous, straight, sharp spines, and it bears shearing and clipping well. It is readily raised from the seed, and the pieces of the roots which are trimmed away on setting the young hedge plants will make abundance of new ones if properly cared for in the nursery. For beauty of leaf and flower the privet (*ligustrum vulgare*, Linn.) can be recommended for hedges, the foliage being nearly evergreen, and the stems capable of being made thick and compact. Some employ the arbor vitae (*thuya occidentalis*, Linn.); and where protection from cold winds is needed, this fine tree, planted in hedge rows and suffered to grow tall, makes a lasting and pleasant fence, its naturally compact and flattened stems being admirably calculated for the purpose. For vigor, abundance of suckers and of branches, for spiny stems and leaves, brilliant and useful fruit, the common barberry should not be overlooked, especially near the sea coast, where it seems to thrive best. The seeds germinate most readily, and the seedling plants are fit for making into hedges in the 2d or 3d year. In order to insure success in forming hedges, a few precautions only seem essential. These are, a well prepared border of good soil, in which the young plants are to be set, freedom from weeds, and judicious trimming. It will be best to allow the plants to grow upward as they will, and to direct the shearing to the sides, so as to form numerous thick branches and twigs. Beside the shrubs already enumerated, various kinds of trees have been employed for hedges, such as the beech, the 3-thorned gleditschia, the hemlock fir, the red cedar, the sour gum, &c.

HEDGE, FREDERIC HENRY, D.D., an American clergyman and author, born in Cambridge, Mass., Dec. 12, 1805. His father was for a long time professor of logic and metaphysics in Harvard college. In 1818 the son accompanied Mr. George Bancroft to Germany, and there studied at Ilfeld and Schnlpforte. In 1823 he returned to America, and in 1825 was graduated at Harvard college. After 3 years of study in the theological school, he entered the ministry in 1828, was soon settled in the Congregational church at West Cambridge, and in Sept. 1830, was married to a daughter of the Rev. John Pierce of Brookline. In 1835 he accepted a call to be pastor of the Unitarian church in Bangor, Me., where he remained for 15 years. In 1847-'8 he made the tour of Europe, revisiting Germany, and spending a winter in Italy. In 1850 he received a call from the Westminster church in Providence, R. I., and remained its pastor until 1856, when he took charge of the First Congregational church in Brookline, Mass., with which he still remains. In 1852 he received from Harvard college the degree of D.D., and in

1857 was chosen professor of ecclesiastical history in the theological school in Cambridge. In the same year he took charge of the "Christian Examiner," the organ of the Unitarian body. He is also the present president of the American Unitarian association. His largest work is the "Prose Writers of Germany" (8vo., Philadelphia, 1848), in which extracts from 28 authors, from Luther to Chamisso, are given, each series preceded by a careful original sketch of the author and estimate of his genius and influence. Beside these introductory sketches, a large portion of the extracts were specially translated for the work by the compiler. Dr. Hedge has also published versions of many of the minor poems of eminent German writers, especially Schiller and Goethe. In 1853, in connection with the Rev. Dr. Huntington of Boston, he published a volume of hymns, many of the best of which are his own compositions and translations. In the same year also appeared his "Liturgy for the Use of the Church." He has also published sermons, orations, reviews, and magazine essays, extending in time over more than 30 years. Of these may be specified as the most remarkable, the sketch of the transcendental philosophy in the review of S. T. Coleridge ("Christian Examiner," 1833); the Phi Beta Kappa oration, on "Conservatism and Reform," delivered at Cambridge in 1840; the article on Augustine in "Putnam's Monthly" for March, 1856; and the article on Leibnitz in the "Atlantic Monthly" for June, 1858.

HEDGEHOG, an insectivorous mammal, of the genus *erinaceus* (Linn.). The teeth are 36 in number, but have been differently divided by zoologists; F. Cuvier gives the following: incisors $\frac{3}{1}$, canines none, false molars $\frac{3}{3}$, and true molars $\frac{4}{4}$; according to Owen, they are developed as incisors $\frac{3}{3}$, premolars $\frac{4}{4}$, and molars $\frac{3}{3}$. The central incisors of the upper jaw are separated from each other, those of the lower nearly touching; behind the first upper incisor on each side are 2 small single-rooted teeth, resembling false molars, but evidently incisors from their development in the intermaxillary bone; after these, and separated from them by a small interval, are 3 false molars, the 1st the largest; then the 4 true molars, the 2d the largest, the 4th very small, and all tuberculated; in the lower jaw, after the single incisor of each side, are 3 small single-pointed and single-rooted teeth resembling false molars, and after these, with a short interval, 4 molars, the 2d and 3d the largest; the crowns of the teeth lock into each other, as in other animals preying chiefly on insects. When full grown, the common hedgehog (*E. europæus*, Linn.) is about 9 inches long, of a heavy form, short limbs, and slow plantigrade motion; the upper part of the body is covered with sharp prickles, about an inch long, arranged in clusters, divergent and crossing each other, of a brownish black color with a white point; the head is clothed with harsh brownish hairs, and the under parts of the body with a dirty white fur; the ears and

tail are short; the paws, end of nose, and tail are nearly naked; the eyes are prominent, and the opening of the ears may be closed by a valvular arrangement of the cartilages; the nose is considerably longer than the jaws, and fringed at the end; the lips are entire, and there are no cheek pouches; the 5 toes are armed with long nails, the middle the longest, suitable for digging; the soles are covered with naked tubercles, possessing an exquisite sense of touch; the mammae are 10, 6 pectoral and 4 ventral. By means of the development of the *panniculus carnosus* muscle, belonging entirely to the skin, the animal is able to roll itself into a ball, and preserve this attitude as long as it pleases without much effort, presenting to its enemies a thorny mass which the most voracious and powerful dare not attack. The hedgehog is a nocturnal animal, concealing itself during the day in burrows or natural holes, coming out at night in search of worms, insects, snails, roots, and fruits; though possessing very limited intelligence, it has been so far domesticated as to be brought up in gardens, where it proves of great service in destroying insects injurious to vegetation; the flesh is said to be good eating. The young are born in May, covered with prickles, with eyes and ears closed, and about 2 inches long. When at rest, the hedgehog has the power of lowering the prickles, and of retaining them smooth on a level with the body. This species occurs throughout temperate Europe, and was well known to the ancients. The popular name urchin and the French *hérisson* are evidently derived from the Latin *erinaceus*; it is the *εχινος* of the Greeks. The prickles were formerly used to hatchel hemp. A second species, the long-eared hedgehog (*E. auritus*, Pall.), is found in the eastern regions of the Russian empire; the ears are nearly as long as the head; the body and limbs are more slender, and the under hair finer, than in the preceding species. Like the other hedgehog, it hibernates in winter in holes a few inches below the surface of the ground; it can eat cantharides and other vesicating insects with impunity; it grows very fat in the autumn, preparatory to going into winter quarters. Other species of the genus are described. There is no proper hedgehog in America; the rodent porcupine, similarly armed with quills, is called hedgehog in some parts of the United States. This animal displays one of the most remarkable provisions of nature for protecting a weak and harmless creature against the attacks of the strong and cruel.

HEEREN, ARNOLD HERMANN LUDWIG, a German historian, born in Arbergen near Bremen, Oct. 25, 1760, died in Göttingen, March 7, 1842. He studied at Bremen, and subsequently at the university of Göttingen, applying himself with particular zeal to philology and history under the guidance of Heyne, whose daughter he afterward married, and of Spittler. After a literary journey to Italy, France, and the Netherlands, he was appointed professor of philosophy, and in 1801 of history, at Göttingen.

He was for some time one of the editors of the *Bibliothek der alten Literatur und Kunst*, and, after the death of J. G. Eichhorn in 1827, editor of the *Göttinger gelehrte Anzeigen*. The subject of his lectures at the university was chiefly the history of Greek and Roman antiquities and of literature, and a principal merit of his numerous historical writings consists in an original elucidation of the commercial affairs and relations, as well as of the origin and political development of the ancient states. Beside the edition of Menander's *De Encomiis* (1785), and the *Eclogæ Physicæ et Ethicæ* of Stobæus (4 vols., 1792-1801), the following are his most important works: "Ideas on the Policy and Commerce of the most Distinguished Nations of Antiquity" (2 vols., 1793-'6; 4th ed., 6 vols., 1824-'6; the part relating to ancient Greece was translated into English by George Bancroft); "History of the Study of Classical Literature since the Renaissance" (2 vols., 1797-1802); "History of the States of Antiquity" (1799; 5th ed., 1826; translated into English by George Bancroft, Northampton, 1828); "History of the Political System of Europe and its Colonies" (1809; 5th ed., 1830; translated by George Bancroft, Northampton, 1829); *De Fontibus et Auctoritate Vitarum Parallelarum Plutarchi* (1820); all of which were published in Göttingen, where also a collection of his "Historical Works" appeared in 15 volumes (1821-'6). To his minor writings belong sketches of Johannes von Müller, Spittler, and Heyne, a treatise on the influence of the Normans upon the French language and literature, and a dissertation on the crusades. His "Ideas" were translated into English, and published at Oxford by D. A. Talboys, under the title of "Historical Researches." A uniform edition of his translated works, under the title of "Heeren's Historical Works," has been published by Boln (7 vols. 8vo., London).

HEGEL, GEORG WILHELM FRIEDRICH, a German philosopher, born in Stuttgart, Aug. 27, 1770, died in Berlin, Nov. 14, 1831. In the religious wars of the 16th century his ancestors, driven from Carinthia, found refuge in Swabia. He was the eldest son of Georg Ludwig Hegel, a man of probity and public consideration, and his wife Maria Magdalena Fromme, a woman of good culture, who taught the studious and quiet youth the elements of grammar. From his 8th to his 18th year he was thoroughly trained in philology, mathematics, and history, in the gymnasium of his native town. His scholarship was already productive. He began a system, which he never abandoned, of making and arranging copious extracts from all the books and even journals that he read; and he was always a great reader of newspapers. These treasures, constantly accumulating, gave him materials in all branches of knowledge to be incorporated into his universal system. In 1788 he became a student of theology at Tübingen, having a stipend on a ducal foundation. He heard Storr on dogmatics,

Schnurrer in exegesis, Flatt in philosophy; and was also well taught in botany, anatomy, and other sciences of observation. As yet the young Hegel was chiefly noted for iron diligence, reserve, and maturity; he was familiarly addressed as "old fellow." With some of the students he read Plato and Kant; but his subsequent philosophical fame took them by surprise. The progressive aspects of the French revolution enlisted his sympathies. In 1790 Schelling, then 15 years old, came also to Tübingen; he and Hegel studied, talked, and roomed together, little aware of that strange destiny by which the younger became the leader of the elder, and the elder supplanted the younger, and the younger yet again succeeded the elder in the development of German idealism. After quitting the university, Hegel (like Kant and Fichte) was for a long time a tutor in private families; from 1793 to 1796 at Bern in Switzerland, and from 1797 to 1800 in a more eligible position at Frankfort-on-the-Main. His studies meanwhile took a wide range. He read Thucydides, Montesquieu, Gibbon, and Hume, and thoroughly pondered the Greek and German metaphysics. He began a "Life of Christ;" wrote and rewrote a "Criticism of Religious Ideas;" and corresponded with Schelling about his essay on the Ego (*Vom Ich*), which was stirring the pulse of ardent thinkers. He passed through, in his own experience, the conflict between the older supernaturalism and the prevalent rationalism, neither of which harmonized with his speculative tendencies. Yet, to the end of his life, he professed accordance with the Lutheran orthodoxy, and one of his later public addresses was a eulogy upon the principles of the Augsburg Confession, pronounced as rector of the Berlin university upon the tricentennial celebration in 1830 of the adoption of that instrument. Before 1800 he had drawn up the outline of a system of philosophy in 3 parts: the 1st on logic and metaphysics combined; the 2d on the philosophy of nature; the 3d on the philosophy of mind or spirit. Here was already foreshadowed that identification of logic and metaphysics, which is one of the marked peculiarities of the Hegelian system. But as yet he had not clearly mastered the idea or the method of his scheme; he needed sharper thought and conflict to know whereto all this study was to grow. Hegel's father died in 1799, leaving him a patrimony of 3,000 florins, and he at once determined to devote himself to philosophy at Jena. This university had been made illustrious in literature by the new romantic school of the Schlegels, Novalis, and Tieck; Fichte had just been driven thence to Berlin on the accusation of atheism; Schelling was now there, arousing the enthusiasm of the novices in the mystery and marvel of the new philosophical intuition; and here, too, Fries, Krause, and Ast were commencing their fruitful philosophical career. To the philosophical world Hegel presented as his introduction an essay on the "Difference between Fichte and Schelling," advocating, more defi-

nately than the latter had done, the position that this difference was not adequately designated by saying that the former taught a subjective and the latter an objective idealism, but rather that Schelling's system included both. This dissertation was published in the spring of 1801; in the autumn its author became *Privatdozent* or tutor in the university. Rosenkranz thinks it significant of the autumnal character of his system, that all the great changes in his life occurred in this season of the year. His dissertation on his appointment was *De Orbitis Planetarum*, a zealous advocacy of the German Kepler against the English Newton, and containing also an unlucky polemic against Bode's law about the proportional distances of the planets; even going so far as to suggest that, according to the true law, the space between Mars and Jupiter should not be filled up, ignorant that Piazzi had already discovered the asteroid Ceres. From 1801 to 1806 (in which last year he became professor) he lectured on logic, the philosophy of nature, psychology, ethics, &c. His first course was given to 4 auditors. Awkward in his delivery, incumbered by his thoughts, he failed to interest any but the most thoughtful. "He thinks in substantives," said one of his auditors; and not seldom was the structure of his sentences incomplete. Carrying to his lecture a mass of loose papers, he would fumble among them, arranging them dialectically, under his rigid categories, as he went along. But as his "dry light" became warm, his eye and voice would grow keen, and he would often break out into an aphorism, a sarcasm, or a pregnant antithesis, long to be repeated. His best MSS. were copied from the students' notes. At Jena, too, in conjunction with Schelling, he edited the *Kritisches Journal der Philosophie*; and these two philosophers were still so nearly agreed, that the authorship of one of the most important articles was afterward claimed by both; it is on the "Relation of the Philosophy of Nature to Philosophy in General," and is included in Hegel's works, though claimed by Schelling as his own. Hegel's lectures at this period on the philosophy of history contain some of the strongest statements, afterward modified, implying a pantheistic confusion of God and the world. But even then God was to him, not a mere substance (as in Spinoza), but a subject, and, as such, spiritual, the absolute spirit. The statement sometimes made that Hegel identified God and nothing, and that this is the sense of his system, is an entire misconception as well as an absurdity. His career in Jena was brought to a close by the French invasion of 1806. In the turmoil of that campaign, his chief solicitude was about the fate of some of the last sheets of his "Phenomenology," which he was sending to a publisher in Bamberg. The MS. was saved, but the philosopher's house was sacked by French troops, and he was reduced to his last penny. In 1807-'8 he was editor of a political sheet in Bamberg, and there, too, he projected a work on the political constitution of Germany, which

was never completed. At Nuremberg he was rector of the gymnasium from 1808 to 1816, and gave philosophical lectures to the lads, issued as the 18th volume of his collected writings under the title *Propädeutik*—a simple, clear outline of the main points of his general system, in as popular a style as the abstruse subject admits. His administrative ability was here seen to be of a high order; he was even punctilious as to all fit rules and observances. In Sept. 1811, he was joined in wedlock to Marie von Tucher, of an ancient Nuremberg family, 22 years his junior—a lady of refinement, decided in her Christian convictions, indefatigable in her daily charities, to whom he was attached with singular love and tenderness. To his constant friend Niehammer he wrote, that "when a man has found a position and a wife that he loves, he is quite complete for life." Often would he praise her in verse, and his best letters are those he wrote her on his journeys. Two sons, Karl and Immanuel, were the fruit of this union. His domestic affairs were carefully arranged; he himself kept a minute account of all expenses. This family life was one of unbroken peace; and it may have mitigated, as in the case of Comte, the abstractions of his system. Some of the severest parts of his "Logic," as the writer happens to know, were written while he was watching as a nurse at the bedside of this devout and loving woman. A curious parallel is suggested by the enumeration which Rosenkranz gives of the married and unmarried philosophers of modern times. Descartes, Spinoza, Malebranche, Leibnitz, Wolf, Locke, Hume, and Kant were unmarried; Fichte, Schelling, Hegel, Herbart, and Krause were married.—But the biography of a philosopher centres in his writings; his life is the growth of his system. Hegel's "Phenomenology," which he used to call his "voyage of discovery," was issued at Bamberg in 1807. It sketches the psychological progress to his system. Its object is to describe the stages and process through which the mind must proceed from the simplest form of consciousness up to absolute knowledge; and to exhibit this, not merely as a matter of fact, but also as a (logically) necessary ascent. One of his disciples says that in this most finished of his writings he is the Dante of philosophy, since he shows how consciousness passes from the inferno of sense, through the purgatory of the understanding, into the paradise of philosophic freedom. In principle and method it is a protest against Schelling's imagination of a special intellectual intuition. The absolute is not "shot out all at once, like a ball from a pistol;" it is, and it is attained by, a process. The stadia of this process are, simple consciousness, self-consciousness, reason, spirit (here used as equivalent to objective morality), religion (including art), and absolute knowledge. The process itself is a necessary one; the method is immanent in thought. Its moving principle is that of contradiction or negation. Each lower stage is contradicted or negated in thought; this ne-

gation does not give zero (0) as its result, but rather an opposite or antagonistic principle; and these antagonistic principles struggle through (the negation of the negation) to a higher unity; and so on, until we arrive at that absolute knowledge which is the result as it was the source of these evolutions, in which all these antagonisms are both abolished and preserved. Arrived at this state of knowledge, the spirit knows itself to be identical with universal reason; the finite self-consciousness and the absolute self-consciousness are one; the infinite is no longer foreign to and outside of the finite. With a knowledge of this high consummation, the race enters upon a new epoch; the old has passed away; the conflicts of all the schools are adjusted. Man knows the absolute reason; the absolute reason knows itself in man. To this all history, all thought have been tending; the history of thought is this very process; the completion of thought is found in the science of the absolute. Such was the daring prophecy with which a secluded student, in the ancient and quiet city of Nuremberg, heralded a revolution in the world of mind. Nor did he stop with the proclamation. In his "Logic," published in 2 volumes, 3 parts, between March, 1812, and July, 1816, he developed his system in its most rigorous and abstract form. This is one of the boldest and subtlest works of human speculation. It is designed to answer the question to which the "Phenomenology" led, viz.: What is that absolute knowledge which has been shown to be necessary? It is the completion of the system of categories, which Kant had elaborated, after Aristotle. It is not logic alone, nor metaphysics alone; it is both together. It is not the science of thought alone, nor that of being alone; it is the science of both thought and being, viewed as identical and pervaded by the same logical law. The whole system is reason itself, or the absolute idea—absolute idealism. The terms logic, idea, and reason are used in an unusual, in a universal sense. Reason and idea are not merely subjective; logic gives the law of being as well as of thought. That Hegel reduced all knowledge to that of mere relations and all being to mere logic is an entire misconception of his theory. The system of logic, as the first part of philosophy, contemplates reason (the idea) as it is in itself, and not in its manifestations. Hegel used to call it "the kingdom of the shades;" his "voyage of discovery" led him first into this kingdom. He also speaks of it as equivalent to "God in his eternal being, before the finite world was created." In Platonic phrase, it is the ideas of the Divine mind, before they assume finite forms and modes. These ideas (this idea) are developed by an immanent law, the dialectic process of which we have spoken above; and herein consists the peculiarity of the work. The process is that of the idea itself, and all that we do in the matter is to stand by and see how it is done; though there must be "speculation in the eyes" that see this process carried through and out. Thus,

we begin with the conception of being—the most universal and indeterminate of all. As entirely indeterminate, it is the same as nothing. Being and nothing are thus the same, but they are also different; they are identical, but antagonistic; and, as such, they result in a process of becoming (*das Werden*), for the very idea of becoming includes being and not-being. This is ingenious and acute as an analysis of the conceptions; but is it a real or possible process in being as such? The whole science of logic is distributed into 3 parts—being, essence, and conception; the first two are the ontological logic, the 3d is the subjective logic. The categories that fall under being are 3—quantity, quality, and measure. The categories under essence are also 3—essence in itself, phenomena as expressing essence, and actual existence as the union of the other two. Here also, of course, come the discussions about the antinomies of the understanding. The categories of the 3d part of logic, that is, of conceptions or notions, are 3—the subjective conception, the object, and last and highest of all, the idea. This logic, now, forms the first great division of Hegel's whole scheme of philosophy. This was fully presented, in outline, in his *Encyclopädie der philosophischen Wissenschaften*, published in 1817, a 3d edition in 1830, and issued in his collected works with additional notes from his lectures. Here the categories of the "Logic" are applied to all the particular sciences. Of his whole system, the most general idea is that of God or the Absolute Spirit. This spirit is not mere substance, as in Spinoza, but also subject, and as such contains the principle and law of its own evolution. This law is a perpetual trichotomy—thesis, antithesis, synthesis. Accordingly the "Encyclopædia" has 3 main parts, viz.: "Logic," the "Philosophy of Nature," and the "Philosophy of Spirit." Each of these has, again, a threefold division; and these 3 yet other 3; and this rhythm of triads makes the harmony of the system. Logic, as we have already indicated, presents this absolute spirit or idea, as it is in itself, in its shadowy, ghostly form. In the "Philosophy of Nature" we have the same idea in its objective manifestation, in the forms of space and time. Here the idea or spirit becomes, as it were, a stranger to itself, yet this, too, by an inward necessity. How it comes to do this is one of the knots of the system; but that it does so is evident from the fact that nature is. Nature is here reconstructed—or, Hegel would say, we see how it is constructed—according to the high *a priori* method, in its 3 departments of mechanics, physics, and organized beings. These refined demonstrations have not had much effect upon the naturalists. But the absolute spirit, having run through the round of nature, emerges into its 3d sphere (in an equally recondite way), that of mind or spirit itself; spirit here finds and knows itself, of course, in 3 stadia. First, it is subjective spirit, including anthropology, phenomenology, and psychology. Then it passes

over into objective spirit, or the sphere of ethics, which has 3 subdivisions: 1, law or right; 2, morality, private and personal; 3, public ethics, including the family, society, and the state. In fine, spirit becomes absolute spirit, and as such shows itself in 3 modes, art, religion, and philosophy; and in the last the circle is completed, the end returns to the beginning, the absolute spirit knows itself, and the Hegelian system is all in all.—This "Encyclopædia" was first issued while Hegel was in Heidelberg, where he became a professor in 1816, declining invitations to Erlangen and Berlin—the latter, it is said, in part because the Prussian minister proposed that he should be examined as to his capacity for lecturing after his 8 years' seclusion in Nuremberg. From this point his fame rapidly rose. His disciples began to be ardent and prophetic. His system was proclaimed as completing the structure of German idealism. Kant had critically prepared the way; Fichte had taught a subjective idealism; Schelling had not risen above an objective idealism; but in the absolute idealism, the partial was dethroned and the universal made supreme. Cousin, passing through Heidelberg, proclaimed to the world that in Hegel (whose "Logic" he said he could not grasp) he had found a man of genius; and in his later brilliant course at Paris, in 1828, he availed himself of the generalizations and methods of the great idealist for the interpretation of history and the history of philosophy. A second invitation to Berlin in 1818, urged by the minister Von Altenstein, Hegel's warm personal friend, was welcomed by him. He was now in the ripeness of his manhood, and animated by the consciousness that all past thought had found its culmination in him. As the devoted Michelet has it, he was "the crown of the whole past and the seed of the most fruitful future." His new position was most favorable for the propagation of his opinions. Berlin university had always been enthusiastic for speculation; it received Fichte when Jena expelled him, and Hegel came into Fichte's chair, expressing his confidence that "the sands of Berlin were more susceptible to philosophy than the romantic environs of Heidelberg." He would there "teach philosophy to talk German, as Luther had taught the Bible to do, and Voss Homer." His lectures soon became the rage. Officers of state and the literati and savants of Berlin sat on the students' benches. The government provided liberally for his salary, and also for journeys to Paris, Holland, &c. He took the bearing of the founder of a new and great school. Hegelianism was the road to office. The master became sometimes overbearing; even Varnhagen von Ense says that he was "tyrannical." Professor Gans was one of his most zealous disciples, but Hegel called him to a sharp account for having dared to "recommend," on the university bulletin, his work on ethics. "What had he done, that Gans should recommend him!" He mixed more freely in general society, and indulged himself in his two

chief relaxations, snuff-taking and card-playing. But in society he was distant; it is on record that an intelligent young lady said she "never heard him speak a marked word." His previous lectures on the different branches of philosophy were carefully revised, and he wrote two new courses, on the "Philosophy of Religion" in 1821, and on the "Philosophy of History" in 1827, in both of these branches introducing an original and scientific elaboration of the materials. His "Outlines of the Philosophy of Right" was issued in 1821, combining in one exposition natural rights, ethics, and the philosophy of society and the state. Man's moral being expresses itself completely in the state; to this, natural rights, private morals, and even the church, are rightfully subordinate. The preface to this work aroused more controversy than the work itself, since it summed up its teachings in the noted aphorism: "The rational is actual, and the actual is rational." This was interpreted in an ultra conservative sense; explained in any different sense, it was a mere truism. In fact, he was understood as supporting the existing Prussian system as the perfection of reason and freedom. This for a time helped his metaphysics; though his extreme disciples soon "changed all that." He used to fight his battles in his prefaces. In a preface he declared against the position of Schleiermacher, that the feeling of absolute dependence is the essence of religion. These two men were then at the height of their fame, both at Berlin; neither liked the other, and their disciples have perpetuated the struggle to the present time. The theologian opposed the admission of the philosopher into the academy of science; and the philosopher would not allow the theologian to take part in his scientific journal. The real difficulty was that Schleiermacher tried to find in human nature a foothold for religion independent of philosophy, and Hegel's speculations did not allow this to be done. His system received concentration and impulse from the establishment, with the favor of government, of the Berlin *Jahrbücher für wissenschaftliche Kritik* (1827). All things were here discussed in the light of absolute knowledge. The school became haughty and uncompromising; they had solved the problem of the universe, and nothing remained but to bring all thoughts into subjection. Germany was alive with speculation; it had never known such a philosophical ferment. Even orthodox men gave in their adhesion, and Hegel was not loath to encourage them. Göschel, the jurist, wrote "Aphorisms on Science and Nescience," applying Hegelianism to the defence of the mysteries of Christianity; and Hegel reviewed the work, with an almost eager welcome, in the *Jahrbücher*, to show that his system was the same thing in the sphere of speculation that the Christian religion was in the sphere of faith. In the preface to a new edition of his "Encyclopædia," he quoted from Tholuck on the oriental trinities to show that he held to the Trin-

ity more thoroughly than did this genial divine. The mystics he eulogized with Baader, and the theosophic Boehm he declared to be not merely fantastical, but also profound. The rationalists had no more violent foe than this prophet of the universal reason; he defended against them the truths of the incarnation, of sin, and of redemption. Conservative rationalism was indignant; the popular philosophy was dumb with amazement. There were many that said the long conflict between philosophy and faith was now to be adjusted; the absolute idealism was to do it, and it was to be done in Berlin, "the city of absolute reflection," the "university of the centre," the "chosen people of God in philosophy." Enthusiastic students declared that the refined ideas of the "Logic" were "the new gods" of a new Pantheon. The triumph of his system seemed to be coming on. In 1820 he was rector of the university, and administered its affairs with the punctuality and painstaking of an accomplished disciplinarian; not a single student was punished for "demagogism," though one unlucky wight was taken up for wearing a French cockade, which in his simplicity he imagined to be made up of the colors of the mark of Brandenburg. In 1831 Hegel published the first volume of a new edition of his "Logic," and revised for the press his lectures on the "Proof of the Being of God." In the autumn he commenced his course in the university with more than usual freshness and vigor. But the fatal cholera attacked him in its most malignant form on Sunday, Nov. 13; his wife watched over him, ignorant to the last of the nature of the disease. On the next day at 5 o'clock he was dead. Nov. 14 is the anniversary not only of the decease of Leibnitz, the greatest German philosopher of the 18th century, but also of him whom his pupils not unfitly called the Aristotle of the 19th century. He was buried near Fichte and Solger, and over his remains was celebrated the worship of genius by disciples almost idolatrous. His works were soon collected in 18 volumes, for the most part carefully edited. Beside the treatises of which we have spoken, there are 3 volumes of essays and reviews; 3 on "Æsthetics;" 3 on the "History of Philosophy;" 2 on the "Philosophy of Religion;" one on the "Philosophy of History." Rosenkranz has written a full biography, from which we have derived many of our statements. Every subsequent philosophical writer of note in and out of Germany has criticized his system. The fullest accounts are in the histories of philosophy by Michelet, Erdmann, and Willm; the ablest criticisms are those of Schelling, Trendelenburg, Ulrichi, Weisse, Fischer, and the younger Fichte. A. Véra published in Paris *Introduction à la philosophie de Hegel* (1855), and is now (1860) translating the "Logic" into French—a difficult task. Hegel said to Baron Reiffenberg, who asked him for a succinct account of his system: "Monsieur, it is impossible, especially in French." M. Ch. Bénard has partly analyzed and partly translated the

"Æsthetics" in French (5 vols., Paris, 1840-'52). This was the best edited of any of his posthumous works, by Prof. Hotho. The "Subjective Logic" was translated into English by H. Sloman and J. Wallon, and published in London (1855). His "Philosophy of History," the most intelligible of his works, translated by J. Sibree, forms a volume of Bohn's "Philosophical Library" (1857). The Hegelian literature would already make a collection of several hundred volumes. In Holland, Van Ghert, Prof. Sieber, and Dr. Krahl espoused his system; Heiberg in Copenhagen; Tengström and Siendwall in Finland; a Hungarian wrote to him that he was learning his "Logic" by heart.—Altogether apart from the main peculiarity of his system, the impulse which this extraordinary thinker communicated to the various departments of philosophy was almost unexampled in the same space of time. He compelled men to think for him or against him. His "Logic" led to the treatises of Werder, Weisse, Erdmann, Trendelenburg, and Ulrichi, as well as to a total revision of Schelling's system. His "Psychology" was followed by Massmann, Wirth, Erdmann, Rosenkranz, and the "Anthropology" of Daub. His "Ethics" gave a more philosophical model for this science, and produced the treatises of Von Henning, Michelet, Vatke, Daub, and Wirth, and influenced the systems of Chalybäus, Fichte, and Rothe. In the "Philosophy of History" he made the boldest attempt to construct the whole according to the evolution of the idea of freedom. His "Æsthetics" almost transformed the science, and led to the works of Weisse, Hotho, Röttscher, and Vischer. In the "History of Philosophy" he first introduced the general method of treatment, followed by Marbuch, Michelet, Bayr-hoffer, Barchon de Penhoen, Willm, Zeller, and Schwegler; his criticism of Aristotle has contributed more than any other to the understanding of Aristotle's real metaphysical system. Even in the "Philosophy of Nature," though many of his views are not proved by observation, and though his deductions are often arbitrary, he has yet added to the materials for a truly philosophical construction of the cosmos; he early advocated Goethe's theories about colors and the metamorphosis of the plants. In jurisprudence, the conservative tendencies of his system were soon annulled by his more advanced followers, and the most radical German revolutionists of 1848 expressed their extreme views in the dialect of the absolute idealism; as *e. g.* Ruge in the *Hallische Jahrbücher* (1838). But it was in theology, and in the relations of his system to Christianity, that the chief conflicts were engendered. Soon after his death his school fulfilled the master's prediction, and illustrated his theory of antagonisms. His lectures on the "Philosophy of Religion" were twice edited; first in a conservative sense by Marheineke, and then in a revolutionary sense by Bruno Bauer. Passages in his "History of Philosophy," from his lectures

of 1805, were declared to be much more pantheistic than his matured views; Strauss thought that he was opposing Hegel until these lectures were published. The conflicting elements came out at first in discussions upon 3 points, the personality of God, immortality, and the person of Christ. Strauss's "Life of Jesus" (1835) brought the latter decisive point to an articulate statement; and in his subsequent controversial writings he ranged the school, after the French political pattern, in 3 divisions, the right, the centre, and the left. This division was first made in reference to Christianity. The right wing asserted that Hegelianism and orthodoxy were harmonious; Göschel, Gabler, Erdmann, Marheineke, and Bruno Bauer for a time stood here. The middle was represented by Rosenkranz, Gans, and Vatke. On the left stood Michelet, Strauss, Ruge, the radicals in church and state, and those who denied immortality, the divine personality, and the incarnation as specific in the person of Christ. The Tübingen school of F. C. Baur has worked in the interests of a destructive criticism. Against all these modifications of the system, the great body of the German divines, especially the school of Schleiermacher, have protested from the beginning, evidently believing that the tendencies of Hegel's speculations were pantheistic, whatever judgment might be formed about his personal opinions; and the progress of discussion has confirmed these fears. His restless and aspiring school soon ceased to be a solid phalanx. Herbart's realism contended, not unequally, against this extreme idealism. The Prussian government called Stahl the jurist, and Schelling, to Berlin to counteract the philosophy it had so carefully nurtured. Schelling in 1834 had already pronounced against his old colleague; and when nearly 70, in 1841, he taught his positive philosophy in opposition to what he called the "abstractions" and the merely "negative system" of his greatest rival, his only peer. A new school, represented by the younger Fichte, Weisse, Chalybäus, Fischer, Wirth, and Ulrici, in the *Zeitschrift für Philosophie*, since 1837, and in a prolific literature, have been waging incessant warfare against the absolute idealism, and the pretensions of pantheism. The absolute idealism has already taken its place in history as the crowning development of one great philosophic tendency. It has not proved itself to contain the whole of philosophy. It has not solved the ultimate problems of human thought and human destiny. It has not shown how the infinite and the absolute can pass over into the finite and the relative. Neither its principle nor its method has been proved to be sufficient to explain the universe. Philosophy is not yet exhausted. Faith is not yet lost in sight. The destructive results of pantheism have led to a reaction, in the midst of which we now stand.

HEGIRA (in Arabic, also *hedshra*, flight), the flight of Mohammed from Mecca to Medina, from which event the Mohammedan era is dated. The hegira is usually accounted to have

occurred on the 16th (or, by astronomical reckoning, on the 15th) of July, 622, although Abulfeda makes it 68 days, and others 2 months, later. The Mohammedan year being shorter than our own, the difference between the Mohammedan and Christian calendars is constantly varying, and any date in the one can be transferred to the other only by a special adjustment. Of all cultivated nations, the Mohammedans alone have reckoned time exclusively by the moon, without regarding the sun or seasons. Their year consists of 12 lunar months, or of between 354 and 355 days. The beginning of their year, therefore, retrogrades at the rate of more than 11 days annually through the different seasons, and the circle of retrogradation is completed and a whole year gained once in about 33 years. Therefore 33 Mohammedan years nearly correspond to 32 Christian years, and to transfer a Mohammedan date to our era it is necessary first to subtract 1 from it for every 33 years, and then to add 622 to it. Thus, to find the year corresponding to 1276 of the hegira: $1276 - 38$ (i. e., $1276 \div 33$) $+ 622 =$ A. D. 1860.

HEIBERG, PEDER ANDREAS, a Danish dramatist and political writer, born in Vordingborg in 1758, died in Paris, April 30, 1841. After finishing his studies, he lived 3 years at Bergen, and subsequently at Copenhagen. Banished for liberal opinions in politics in 1799, he went to Paris, obtained office under Napoleon as chief of the bureau of foreign relations, and accompanied Talleyrand to many foreign courts. He was accustomed to make extracts from foreign journals, to which comments were added in the imperial cabinet previous to publication in the *Moniteur*. He retired on a pension in 1817, when he applied himself to journalism, writing for the *Revue encyclopédique* on Scandinavian subjects. His literary reputation rests chiefly on his comedies, many of which still keep the stage.—Heiberg's wife, THOMASINA CHRISTIANA BUNTSEX, who remained in Copenhagen when he was banished, and remarried, was the author of a series of lively novels, regarded by the Danes as the best on Danish society ever written.—JOHAN LUDVIG, a dramatist and metaphysician, son of the preceding, born in Copenhagen, Dec. 14, 1791. He was graduated at the university in 1809, having previously written several excellent dramas. He began the study of medicine, and devoted himself to southern literature, the result of which latter study appeared in a Latin essay on the Spanish drama. At the age of 22 he received from the government a travelling pension, which enabled him to pass 3 years with his father in Paris, where he studied the French drama. In 1822 he became professor of Danish at the university of Kiel, and after 3 years went to Berlin to study the philosophy of Hegel. In 1829 he was made royal dramatic poet and translator. In 1830 he was appointed professor of æsthetics, logic, and literature at the military highschool. In 1831 he married Johanna Louise

Patges, an actress. As a literary and critical writer Heiberg gained a very high reputation in editing the *Flyvende Post* (1827-'30). He has published various philosophical works and dramas, and since 1844 has issued *Urania*, an annual, in which he attempts to give to astronomy a poetic and speculative tendency.

HEIDELBERG (Lat. *Edelberga*; anc. *Myrtilenum*), a city of the grand duchy of Baden, in the circle of the Lower Rhine, on the left bank of the Neckar, 11½ m. by rail from Mannheim, and 54½ m. from Frankfurt-on-the-Main; pop. 15,000. It is chiefly celebrated for its university, founded by the elector Rupert I., in the 14th century, and reformed by the grand duke Charles Rupert in 1802 under the title of Ruperto-Carolina. It has numbered among its professors the theologians Schwarz, Umbreit, and Paulus, the jurists Thibaut, Mittermaier, Vangerow, Zachariæ, and Ran; in medicine and chemistry, Cheilus, Tiedemann, and Gmelin; in history and antiquity, Schlosser, Crenzer, Molina, Baer, and Gervinus. Chevalier Bunsen has also resided of late in Heidelberg. The university library, containing nearly 200,000 volumes and about 2,000 MSS., is extremely rich in antique works and early editions. The university is very complete in its details, embracing a museum of natural history, a physiological cabinet, a chemical laboratory, a lying-in asylum, two botanical gardens, a college of agriculture and forestry, an observatory, and a philological, theological, pedagogical, homiletical, and biblical seminary. There are also an excellent gymnasium or preparatory academy for all sects, and two female schools of high reputation. The situation of Heidelberg, in a picturesque and fertile country, not far from the junction of the Neckar with the Rhine, having on one side the Königstuhl and on the opposite the Heiligenberg, the hills covered with vineyards, and its curious bridge, all combine to render it attractive to the tourist. To travellers its greatest attraction is the castle. It presents in its different portions every phase of architecture from the 14th to the 17th century. In its vaults is the celebrated *Heidelberger Fass* or tun, once the largest in the world. The principal manufacture of Heidelberg is beer; its trade is confined chiefly to linseed, oil, and tobacco.—Heidelberg was attached in 1362 to the Palatinate. Rupert I. enlarged it and made it an electoral residence. In 1384 the emperor Wenceslas signed here the celebrated union of Heidelberg, by which the different leagues of German cities were united in one. Heidelberg was plundered and partly ruined by Tilly in 1622, by Turenne in 1674, and by Marshal de Lorges in 1693. These misfortunes led to its decline in political importance, which was finally completed by the residence of the electors being removed to Mannheim in 1719. It was united to the grand duchy of Baden in 1802.

HEIGHTS, MEASUREMENT OF. See **BAROMETRICAL MEASUREMENTS.**

HEILBRONN, a fortified town of Würtem-

berg, on the right bank of the Neckar, 26 m. N. of Stuttgart, with which city it is connected by railway; pop. 10,000. It stands on the site of a Roman station, and was once a free imperial city. In its vicinity is the castle in which Götz von Berlichingen was imprisoned in 1525.

HEIM, FRANÇOIS JOSEPH, a French painter, born in Belfort, Haut-Rhin, Dec. 16, 1787. In 1824 he received the decoration of the legion of honor, in front of his own picture, the "Massacre of the Jews." He subsequently decorated the ceiling of the gallery of Charles X. in the Louvre with a representation of Vesuvius receiving from Jupiter the fire which was to destroy Pompeii and Herculaneum. His allegory of the *renaissance* of the arts, on the ceiling of the French gallery in the same building, is one of his most admired works. He also painted "Louis Philippe receiving the Deputies at the Palais Royal," now in the museum at Versailles, and a series of 16 portraits of eminent personages contributed to the Paris exhibition of 1855.

HEINE, HENRICH, a German poet and critic, a nephew of the celebrated Hamburg Jewish banker and philanthropist Salomon Heine, born in Düsseldorf, Dec. 12, 1799, or as Steinmann asserts in 1797, died in Paris, Feb. 17, 1856. His first poem was written on Napoleon's visit to Düsseldorf (Nov. 2, 1810). He was soon after sent to the lyceum of Düsseldorf, where he made great progress in the regular studies, mastering also English, French, and Italian. In 1815 he was sent to Frankfurt-on-the-Main to qualify himself for mercantile life. He manifested the greatest repugnance to this pursuit, and his uncle Salomon Heine, having been consulted, consented that "the blockhead" should be sent to the university of Bonn to study law, whither he went in 1819. He studied there every thing except law. In Sept. 1820, he left Bonn for Göttingen, which he learned to dislike and satirized bitterly in after years. He next removed to Berlin, where his character and feelings rapidly assumed that peculiar satirical indifference and reckless audacity now identified with his name. While in Berlin he earnestly studied philosophy under Hegel, and became intimate with Chamisso, Fonqué, Bopp, and Grabbe. Here in 1822 appeared his *Gedichte*, subsequently published as "Youthful Sorrows" in his "Book of Songs." Though favorably received by eminent critics, they attracted at the time but little attention. A single sorrow, the early disappointment of Heine in his love for his cousin Evelina van Geldern, "the angel's head on a Rhine-wine-gold ground," runs through all these poems, displaying a singular number of variations on one theme. He also published at this period his plays *Almansor* and *Radeliff*, with the *Lyrisches Intermezzo*. In the summer of 1822 he made a journey to Poland, which gave occasion to more than one eccentric sketch or picture scattered through his works. In 1823 he returned to Göttingen, and received the degree of doctor of law in

1825. In the same year he went to Heiligenstadt, where on June 28 he is said to have been baptized into the Lutheran church. Heine had taken his legal degree in compliance with the will of his uncle, who had made it a condition of giving him his education, and who, finding him determined to pursue literature, generously aided him. He now went to Hamburg, where in 1826 he published the *Harzreise*, the first part of his *Reisebilder*. Very few books ever excited in Germany such an extraordinary sensation. In 1827 he went to Munich to edit with Dr. Lindner the *Politische Annalen*. In 1829 he returned to Berlin. Here occurred the famous quarrel with the poet Platen, who, having satirized Heine in an insolent manner, received in return the most bitter sarcasm and withering abuse. Literature affords no parallel to this cynical retort. From Berlin Heine went in 1831 to Paris, having become so obnoxious as a liberal writer to the Prussian government that he was obliged to choose between exile and imprisonment. From this time until 1848 his influence in Germany was very great, and he acquired in France the reputation of being the witty French writer since Voltaire. In 1831 he wrote a series of articles on the state of France for the "Augsburg Gazette," which were collected and published both in French and German. In 1833 appeared his "History of Modern Literature in Germany," also known as "The Romantic School," and *L'Allemagne*, a characteristic and daring work, in which he attacked with relentless severity the romantic writers, the philosophers, and in fact very nearly everybody. "This book produced a perfect storm of fury in Germany." Democrats, pietists, Teutomaniahs, and state officials united in denouncing it; while in France no other work has done so much to stop the current of romanticism. In 1840 Heine published a violent work on his former friend Börne, then only recently dead. Börne, while akin to Heine as a spirited writer, had aroused in the latter a dislike, founded partly on jealousy of Börne's political popularity, and partly on personal antipathy caused by literary attacks. The work, whatever its provocation, was but little to Heine's credit, and involved him in a duel with the husband of a virtuous and high-minded lady who was stigmatized in the book as having entertained illicit relations with Börne. About 1841 Heine was married to "Mathilde," of whom he often speaks tenderly in his writings. In 1843 he paid his last visit to Germany to see his mother (who died in Hamburg, Sept. 3, 1859, aged 88), for whom he maintained to the last the warmest affection. His public bitterness and literary cruelties were in strange contrast with his personal good qualities. He was generous, even self-sacrificing, especially to poor literary men, and during the cholera risked his life by remaining to nurse a sick cousin. In 1847 he was attacked by a painful spinal complaint, which tormented him almost without cessation until his death. By his own request all religious rites were omitted at his funeral.

The bold infidelity, the reckless licentiousness, and the unqualified faith in the world and the flesh, which characterized Heine's life as well as his writings, were counterbalanced by such sincere belief in his own doctrines, such sympathy for suffering, and such acute perception of the beautiful in every form, that it is difficult for those unfamiliar with the social developments of modern continental European life and literature to appreciate his true nature or position. He received from the French government an annual pension of 4,000 francs from 1836 to 1848, but did not criticize it the less severely in his writings. In his later years Heine returned from unbounded scepticism, if not to an evangelical faith, at least to theism, the Bible being constantly read by him, and appearing to him, as he said, like a suddenly discovered treasure. As he still retained his love of paradox and of mystification, the real degree of his conversion became the subject of no little controversy and comment.—His works, in addition to those mentioned, are: *Französische Zustände* (Hamburg, 1833); *Der Salon* (1834); *Shakspeare's Mädchen und Frauen* (Leipzig, 1839); *Neue Gedichte* (Hamburg, 1844); *Ballade über die Schlacht von Hastings* and *Atta Troll* (1847); *Romanzero* (1851); *Doctor Faust, ein Tanzpoem* (1851); *Vermischte Schriften* (1854); *Les aveux d'un poète de la nouvelle Allemagne*, in the *Revue des deux mondes* (1854). A complete edition of his works, embracing a considerable number of sketches and poems never before given to the world, was published by John Weik (Philadelphia, 1856). There is also a French version of his works executed by Heine himself, under the revision of Gérard de Nerval and others. The following works on Heine have appeared since his death: *Heinrich Heine, Erinnerungen von Alf. Meissner* (Hamburg, 1856); *H. Heine's Wirken und Streben*, by Strodtmann (1857); *H. Heine, Denkwürdigkeiten aus meinem Leben mit ihm*, by Steinmann (1857); *Ueber H. Heine*, by Schmidt-Weissenfels (1857). English versions of Heine's works are: the "Pictures of Travel," translated by Charles G. Leland (Philadelphia, 1856); the "Book of Songs," by J. E. Wallis (London, 1856); the "Poems of Heine, complete, translated in the Original Metres," by Edgar Alfred Bowring (London, 1859).

HEINECCIUS, JOHANN GOTTLIEB, a German jurist, born in Eisenberg, Saxony, Sept. 21, 1681, died in Halle, Aug. 31, 1741. He was educated at Leipzig and Halle, where he became professor of philosophy in 1710, and of law in 1721. He afterward removed to Frankfurt-on-the-Oder, and there filled the chair of law till 1733, when he returned to Halle, and resuming his former office, held it till his death. The works of Heineccius are very numerous and of great value to the legal student. A collective edition of them was published at Geneva under the title of *Opera ad Universam Jurisprudentiam, Philosophiam, et Literas Humaniores Pertinentia* (9 vols. 4to., 1769).

HEINECKEN, CHRISTIAN HEINRICH, a precocious child of Lübeck, who could speak at the age of 10 months, recite the principal events of the Old Testament 2 months afterward, and who had committed to memory the history of antiquity when little over 2 years old, beside speaking fluently Latin and French. The child died in 1725, before it had attained the age of 5.

HEINEFETER, SABINE, a German singer, born in Mentz in 1805, has performed with great success in the principal cities of Europe. Her sister CLARA, married to Mr. Stöckel, was also a woman of fine vocal abilities, but became a lunatic, and died in the Vienna asylum, Feb. 23, 1857. The youngest sister, KATHINKA, made her début in Paris in 1840, was engaged at the Brussels opera in 1842, but became unpopular there in consequence of a duel which had originated between two young Parisian lawyers while supping at her house, and which had ended fatally for one of them. She retired from the stage in 1857, and settled at Freiburg, Baden, where she died Dec. 20, 1858.

HEINICKE, SAMUEL, a German teacher of the deaf and dumb, born at Nautzschütz, near Weissenfels, Prussia, April 10, 1729, died in Leipsic, April 30, 1790. (See DEAF AND DUMB, vol. vi. p. 501.) He published 10 works, the greater part of them having reference to the instruction of deaf mutes, though 2 or 3 were on theological topics.

HEINROTH, JOHANN CHRISTIAN FRIEDRICH AUGUST, a German physician and writer on psychology, born in Leipsic, Jan. 17, 1773, died there, Oct. 26, 1843. He studied both theology and medicine, and after practising the latter profession was appointed in 1812 to the chair of psychical therapeutics in the university of Leipsic, and in practice devoted himself to curing the insane. His general theory was that mental aberration, passion, and vice originate principally in a badly conducted life, and can only be perfectly cured by a complete moral reform. He was the author of many valuable works on psychology, insanity, &c.

HEINSE, JOHANN JAKOB WILHELM, a German author, born in Langewiesen, Schwarzburg-Sondershausen, in 1746, died in Mentz, June 22, 1803. His first publication was a very free translation of Petronius Arbiter, followed by *Laidion*, an apotheosis of the voluptuous and beautiful in art, in the form of Lais the Greek courtesan. Heinse defended himself against the charge of indecency, while Goethe, impressed by the extraordinary merit of *Laidion*, apart from its immorality, praised it highly. In 1776 he left Gleim to accompany Jacobi to Düsseldorf, whom he there assisted in editing a periodical entitled *Iris*. After living for some time in Italy in pursuit of art and pleasure, in 1782 he went with the artist Kobel to Naples, and returned with Angelica Kauffmann to Rome. Travelling to Germany, principally on foot, he became librarian to the elector of Mentz, and published the famous romance of *Ardinghello*. This was succeeded by *Anastasia*, a romance

consisting principally of problems in chess and scenes turning on the game; and this by *Hildergard von Hohenthal*, the conclusion of *Ardinghello*. In addition to the above, he wrote *Sinnegedichte* (Halberstadt, 1771), and translations of the "Orlando" of Ariosto, and of the "Jerusalem Delivered."

HEINSIUS, ANTONIUS, grand pensionary of Holland, born in 1641, died at the Hague, Aug. 13, 1720. He was an intimate friend and confidential agent of Prince William III. of Orange and during 40 years was the moving spirit of Dutch politics. When William after the peace of Nimeguen sent him to Paris to maintain his claim to the territory of Orange, and the liberties of the Calvinists there, he spoke so freely to Louvois that the minister threatened him with the Bastille. After William became king of England (1689), Heinsius managed for the king, and greatly to his satisfaction, the affairs of Holland, and was instrumental in rendering the states-general favorable to friendly action with England. The celebrated grand alliance on the subject of the Spanish succession, between the emperor, the kings of England, Prussia, and Denmark, Holland, the duke of Savoy, and the elector of Hanover, against Louis XIV. and Philip V., was in great measure due to the exertions of the grand pensionary. The defeats of Blenheim (1704), Ramillies, and Turin (1706), with their results, compelled Louis XIV. to open negotiations. He made overtures to Holland; but Heinsius answered that the Hollanders were inseparably bound to their allies, and exacted as a preliminary condition the recognition of the right of the house of Austria to the Spanish succession. To this France refused to accede; the war was continued disastrously for her, and in 1709 her application was renewed, and met with the same response. Louis XIV. now consented to treat on this basis, and negotiations were commenced; but the allies demanding still greater sacrifices, he renewed the war, and after the defeat of Malplaquet (1709) conferences were again opened at the castle of Gertruydenburg and continued unsuccessfully for 4 months, Heinsius obstinately adhering to his terms. France, everywhere beaten, was in great danger when, in 1711, Queen Anne of England dismissed her whig ministry, displaced Marlborough, and secretly offered peace to Louis XIV. The congress of Utrecht, Jan. 12, 1712, resulted in England's ceasing hostilities, but Prince Eugene, the Hanoverians, and the Dutch persevered in the war, and took Quesnoy, July 3. The defeat of the allies at Denain (July 24) changed the whole state of the war. In a few days several important places were recaptured, and armistices were separately concluded with England (Aug. 19) and Portugal (Nov. 7). Yet notwithstanding these reverses, Heinsius resisted with all his characteristic firmness, doing all in his power to prevent a general peace. In spite of his efforts, one was agreed upon and signed at Utrecht (April 11, 1713), but the signature of Heinsius was the last affixed. It is said that

some days after the signing Heinsius was attacked at the Hague by a pestilential disease then greatly dreaded. To avoid giving an alarm which must have had fearful results, Heinsius kept his malady a secret, with the most stoical patience, so that none knew of it except Count Staremberg, the imperial ambassador, and his physician. He died 7 years later, as vigorous in mind and body as most men at 40.

HEINSIUS, DANIEL, a Dutch philologist, poet, and critic, born in Ghent in 1580, died in Leyden, Feb. 25, 1655. He was educated at the university of Leyden, where he succeeded Joseph Scaliger as professor of politics and history. In 1618 he acted as secretary to the synod of Dort, having previously distinguished himself in the theological controversies of the day. He was a man of extensive learning, great industry, and correct taste and judgment. His editions of the principal Greek and Latin classics rendered him famous over Europe. He was the author of two tragedies entitled *Auracus* and *Herodes Infanticida*; of a poem in 4 books styled *De Contemptu Mortis*; and of various other valuable works.—NICOLAAS, son of the preceding, a Dutch poet, born in Leyden, July 29, 1620, died at the Hague, Oct. 7, 1681. He was educated at the university of his native city. In 1642 he visited England. In 1649 he went to Sweden in consequence of an invitation from Queen Christina, and settled at Stockholm, where he remained till his father's death in 1655. His latter days were unhappy, and passed for the most part in his native land. He like his father published editions of several classics, and was the author of various Latin poems whose style is so sweet that he was called by his contemporaries the "swan of Holland."

HEINSIUS, OTTO FRIEDRICH THEODOR, a German philological writer, born in Berlin in 1770, died May 19, 1849. He was one of the most eminent successors of Adelung in the study of the German language and grammar. His principal works are, *Deutsche Sprachlehre* (5th ed. under the title of *Teut*, 1835), and *Kleine deutsche Sprachlehre* (13th ed. 1834). He is also the author of an interesting work on the Göttingen union of poets (*Der Bardenhain*, 3d ed. 1840), and of a *Geschichte der deutschen Literatur* (5th ed. 1832).

HEIR (Lat. *hæres*), in law, one entitled by descent and right of blood to lands, tenements, or other hereditaments. Hence it is an ancient apophthegm, that "God only can make an heir." Nothing is more common than to hear that A purposes to make, or has made, B his heir. But this is a mere mistake, or rather inaccuracy. A may make whom he will his devisee, and this devisee may take the same estate he would take if he were heir; but he cannot take it in the same way. The heir would take by descent, and only he can so take; he may be disinherited, but his right of blood cannot be transferred, and therefore the devisee takes only by purchase; for in law there are but two ways of taking land, one by descent and the other by

purchase, and whatever taking is not by descent is by purchase. But the law itself makes a concession in favor of wills, from its desire to carry the will of the deceased into effect, and will construe the word heir as having the broader meaning of "successor," if the manifest intention of the testator requires it. And even out of wills, the exact technical meaning of the word is sometimes disregarded in the United States, if justice requires that it should be. Strictly, the heir takes only the real estate; the personals go to an administrator or executor, and are distributed by him to the next of kin. It is even now a common way of expressing that a thing is real and not personal (as is a fixture which must not be removed from the land) by saying that it goes to the heir and not to the administrator. In the Roman civil law, the word *hæres*, which we translate heir, meant what this word does with us in common use, that is, any one called to the succession, by blood, devise, or bequest; and whether the property to which he succeeds be fixed or movable.—AN HEIR APPARENT is one who must be the heir if he survive the owner, as the eldest son in England, or all the children in the United States. But the phrase "heir apparent" is not strictly applicable here. In England, the birth of a younger son cannot affect the rights of inheritance of the eldest son, for they are fixed, and he alone can be heir by descent. But in this country the younger son has an equal right with an elder son; and therefore the exclusive right of inheritance can never be fixed in any children living.—AN HEIR PRESUMPTIVE is one who, if things do not change, will be the heir at the death of the owner, as the elder son of a deceased brother in England, or all the children of a brother in the United States, where the owner has no children; for they will be heirs if he dies without issue. As an heir presumptive may lose his heirship, by a change of circumstances, he does not become an heir apparent so long as this change is legally probable, although physically or naturally impossible. Thus the nephew of the owner can never be his heir apparent, however aged or feeble or near to death the owner may be; for in contemplation of law it is always possible that a son may be born to him, who would be an heir apparent, and who would therefore supersede an heir presumptive.

HELCEL-SZTERSZTYN, ANTONI ZYGMUNT, a Polish writer on law, born in Cracow in 1808. He studied at Cracow and in Germany, fought for the independence of Poland in 1831, commenced in 1833 a series of lectures on law at the university of his native city, founded and from 1835 to 1837 edited the Cracow *Kwartalnik Naukowy* ("Scientific Quarterly Review"), and was subsequently appointed ordinary professor of law at the university. He is the author of various works on judicial subjects.

HELDER, a fortified seaport town of Holland, at the N. extremity of the province of N. Holland, 40 m. N. W. from Amsterdam; pop. 3,000. From an obscure fishing village Na

oleon I. converted this place into a fortress of the first rank, capable of containing a garrison of 10,000 men. Its batteries command at once the entrance to the Zuyder Zee and that of the harbor of the ship canal at Nieuwe Diep. It is connected with Amsterdam by a canal 50 m. long, 125 feet broad, and 21 feet deep, navigable by large vessels. The port and coasts are protected from the aggressions of the ocean by dikes, one of which is 6 m. long and 40 feet broad, and has an excellent road on its summit.

HELEN, the wife of Menelaus, and the most beautiful woman of her age. Her parentage is variously assigned to Jupiter and Leda, the wife of King Tyndareus, to Jupiter and Nemesis, and to Tyndareus and Leda. According to a well known fable, Jupiter in the form of a swan visited Leda, who brought forth two eggs, from one of which came Helen and from the other Pollux. Before Helen was 10 years of age she was carried off by Theseus, who concealed her at Aphidne, under the care of his mother Æthra. Her brothers Castor and Pollux released her, and carried her back to Sparta with Æthra as her slave. She now had suitors from all parts of Greece, among whom was Ulysses. By the advice of this hero Tyndareus left the choice to Helen, and she accepted Menelaus, to whom she bore Hermione, and according to some Nicostratus also. Three years after this marriage she was seduced by Paris, the son of Priam, and fled with him to Troy. The Grecian princes, in accordance with an oath which they had taken when suitors together at the court of Tyndareus, took up arms to restore to Menelaus his wife, and the Trojan war was the consequence. Paris was killed during the siege, and Helen then married Deiphobus, another son of Priam; but when the city was taken, she treacherously introduced the Greeks into his chamber in order to appease Menelaus. She returned to Sparta, and received her first husband's forgiveness. When Menelaus died she was driven into exile by Nicostratus and Megapenthes, and retired to Rhodes, where the queen of that island, Polyxo, whose husband Tlepolemus had been killed in the Trojan war, caused her to be seized while bathing, tied to a tree, and strangled. The Rhodians commemorated the murder by a temple raised to *Helena Dendritis*, or Helen tied to a tree. The Spartans honored her as a goddess, and built a temple to her honor at Therapne, which had the power of conferring beauty upon all ugly women who entered it.

HELENA, SAINT. See SAINT HELENA.

HELENA, SAINT, wife of the emperor Constantius Chlorus and mother of Constantine the Great, born in Drepanum (Helenopolis), Bithynia, in 247, died in Nicomedia in 327. She was probably of obscure parentage, though some historians pretend that she was a British princess. When her husband was made Cæsar in 292, he put her away and espoused Theodora, step-daughter of the emperor Maximian, but in his will he acknowledged Constantine, his son

by Helena, as his sole heir. Constantine, on assuming the purple (306), brought his mother to reside in the imperial palace at Treves, loaded her with honors, gave her the title of Augusta, and conferred her name upon several cities of the empire. Whether she was a Christian by birth or became one by conversion is unknown. She erected and endowed a number of churches, and at the age of 79 made a pilgrimage to Jerusalem, where she discovered the supposed true cross. (See Cross.) She died in the arms of her son, and her body was carried to Rome, where a mausoleum was raised to her.

HELGOLAND, or HELIGOLAND (*i. e.*, "Holy Land;" Dan. *hellig*, Swed. *helga*, to sanctify), an island in the German ocean, belonging to Great Britain; lat. of its lighthouse, 54° 11' 84" N., long. 7° 53' 13" E.; pop. 2,400. Helgoland is of a triangular shape, about a mile in length from N. to S. and $\frac{1}{2}$ of a mile in breadth from E. to W. It was formerly much broader, but the action of the sea is continually wearing away the island. About the middle of the last century a portion was actually separated from the main island, and is now known as Sandy island. Helgoland is distant 100 m. from Hamburg, and 35 m. from the mouth of the Elbe. The highest part of the island, its western side, is 200 feet above the sea. Helgoland is supposed to have been the island mentioned by Tacitus, where the German goddess Hertha was worshipped. St. Willibrod preached Christianity there in the 7th century, and gave it its present name. In 1714 it was taken from the duke of Schleswig-Holstein by the Danes, who kept possession of it till 1807, when it was captured by the English, for whose fleets it served as a station during the war with France, and as a depot for their manufactures, whence they were smuggled into Germany. The inhabitants are descended from the Frieslanders, and speak the Frisian language and the low German. The men are mostly fishermen and pilots, and leave nearly all domestic and agricultural labor to the women. The trading part of the population are chiefly emigrants from the mainland of Germany. The annual value of the fisheries is £5,000. The chief products are haddocks and excellent lobsters, which are conveyed to Hamburg and Bremen, whence they are carried into the interior of Germany. The islanders own 100 small fishing vessels and several larger ones, which make voyages to England and the Baltic ports. The soil is very rich, and grain and vegetables are raised, though most of the land is devoted to the sustenance of flocks of sheep, which are fed on fish in winter. There are a few trees and 2 or 3 springs on the island, but most of the people depend on rain for their supply of water. The English keep a lieutenant-governor and a garrison here, but levy no taxes, and do not interfere with the internal government of the island, which is managed by local magistrates and a municipal council.—See "Heligoland, an Historical and Geographical Description of that Island, its Ancient For-

tunes and Present Opportunities as a British Colony," by William Bell, Ph. D. (London, 1856).

HELICAL (Gr. *ἡλιακος*, solar). In astronomy, the heliacal rising of a star is its rising just before sunrise; the heliacal setting is setting just after sunset.

HELIADÉ, JOHN, a Wallachian poet, born at Tergovitz about 1801, was educated at Bucharest. At an early age he made translations from Voltaire's and Lamartine's poetical works, and eventually gained a foremost place among the regenerators of the Roumanian language and literature, and among the poets of his country by his heroic drama "Mircea" (1844), and by his national poem "Michael the Brave," of which the first two cantos appeared in 1846. In 1831 he founded a national journal, which was suppressed in 1848. Taking part in the revolution of that year, he became a member of the provisional government. After its downfall, in Sept. 1848, he fled to Transylvania and thence to Paris, and afterward resided in the island of Chios, occupied with the completion of "Michael the Brave," until 1854, when he was sent by the Turkish government to the camp of Omar Pasha, in whose company he returned to Bucharest.

HELILANTHUS. See **SUNFLOWER**.

HELICON, a mountain in Bœotia, between Lake Copais and the Corinthian gulf. It is the most fertile mountain of Greece, and produces the greatest number of trees and shrubs. It was esteemed the favorite abode of the muses, to whom the epithet Heliconian is frequently applied by the classic poets. Above Ascræ was a grove sacred to the muses, and not far distant the famous fountain of Aganippe, which was believed to inspire those who drank of it.

HELIODORUS, a Greek romance writer, born in Emesa, Syria, flourished in the 4th century A. D. In his latter days he became a Christian, and bishop of Tricca in Thessaly, where he introduced the regulation that every priest should be deposed who did not repudiate his wife. His famous romance, entitled *Æthiopica*, was written in early life. It consists of 10 books, and treats of the loves and adventures of Theagenes and Chariclea. Its style is simple and elegant. Translations of it now exist in all the European languages, but before the 16th century its very existence was unknown to Europe. The best edition of the Greek text is that published at Paris in 1804 in 2 vols. 8vo.

HELIOGABALUS. See **ELAGABALUS**.

HELIOMETER (Gr. *ἥλιος*, the sun, and *μετρον*, measure), an instrument to measure the diameter of the sun, or other small arc in the heavens. Several instruments for this purpose of different kinds receive this name, but it is now usually applied to a telescope whose object glass is divided into two parts, capable of sliding by each other, so that one may be directed to one edge of the sun, while the other is directed to the opposite edge. Two images of the sun will thus be formed, tangent to each other, and the

amount of displacement of the parts of the object glass measures the diameter of the sun.

HELIOPOLIS (Gr., city of the sun), called in old Egyptian *On* and *Re-er*, in Hebrew *Beth-Snemesh*, and by the modern inhabitants *Matareeyeh*, one of the most ancient cities of Egypt, below the S. E. point of the delta, on the E. side of the Pelusiæ arm of the Nile, near the canal which connected that river with the Red sea, distant about 6 m. N. E. from the site of modern Cairo. From the remotest epoch it was renowned for its temples and priesthood. It was the chief seat of the Egyptian worship of the sun, and also of the sacred bull Mnevis; and the legends of the wonderful bird phoenix centred about it. Its priests were the most learned in the land, and so important that they sent one third of the whole number of deputies to the great council which assisted the Pharaohs in the administration of justice. Those belonging to each temple were organized among themselves with great exactness, and the office of the high priest, who was one of the first persons of the state, was hereditary. The Hebrew Joseph married Asenath, the daughter of one of these high priests. The Heliopolite priests were the usual resort of foreigners who wished to learn the wisdom of the Egyptians. Solon, Thales, Endoxus, and Plato all studied under them; and when Strabo visited the place (24 B. C.) he was shown the halls which Plato was said to have occupied for 13 years. After having been for ages a sort of university city, Heliopolis had much declined as early as the invasion of Cambyses (525 B. C.), and was a city of ruins when visited by Strabo. Abdallatif, an Arab physician of the 12th century, described among its ruins colossal figures in stone, standing or sitting, and more than 30 cubits in height. There now remains an obelisk of red granite, inscribed with the name of Osirtasen I., whose date is fixed at about 2000 B. C., and which is regarded as the most ancient known specimen of Egyptian sculpture; there are also some fragments of sphinxes and of a colossal statue which adorned the ancient temple of the sun. Near the hamlet of Matareeyeh, which occupies a part of the site of Heliopolis, Kleber gained a victory over Turkish troops, March 20, 1800.

HELIOS (Sol), in Greek mythology, the god of the sun, the son of Hyperion and Thea, and the brother of Selene (Luna) and Eos (Aurora). Helios gave light both to gods and to men. He rose in the east from Oceanus, ascended to the highest point in the heavens, and then descending arrived in the evening at the west, and returned to Oceanus. He had two magnificent palaces, one in the east, the other in the west, where he sat enthroned surrounded by ministering Horæ. The horses which drew the chariot in which he made his daily journey were pastured in the islands of the blessed, and the golden boat in which he royaed nightly from the west to the east was the work of Hephestus (Vulcan). Helios was the god who saw and heard every thing. Thus he was able to reveal

to Hephæstus the infidelity of Aphrodite (Venus), and to Demeter (Ceres) the abduction of her daughter. The island of Sicily was sacred to him, and he there had flocks of sheep and herds of oxen, which never increased or diminished in number, and which were tended by his daughters, Phætusa and Lampetia. In later times Helios was frequently confounded with Apollo, though originally they were quite distinct divinities. Among the Greeks, however, this identification was never fully carried out; for no Hellenic poet ever made Apollo to ride in the chariot of Helios. Temples of Helios existed in Greece at a very early period, and subsequently we find his worship established in Corinth, Argos, the island of Rhodes, and various other places. The sacrifices offered to him were rams, boars, bulls, goats, lambs, white horses, and honey. Among the animals sacred to him, the cock was preëminent. Helios was usually represented as riding in a chariot drawn by 4 horses.

HELIOSCOPE. See TELESCOPE.

HELIOTROPE (Gr. ἥλιος, the sun, and τροπή, to turn), an instrument invented by Gauss about 1821, and used to enable surveyors to transmit signals of reflected light from one station to another, and readily to discern those transmitted. It is used abroad in geodetic surveys; in the United States in connection with the coast survey. In illustration of its power, it is said that a mirror one inch square is visible 8 miles off in average sunny weather, and shows as a brilliant star at a distance of 2 miles.

HELIOTROPE (*heliotropium*, Linn.), a perennial plant, with vanilla-scented blossoms, belonging to the natural order *boraginaceæ*. The species most common and the most in repute is *H. Peruvianum*, with a woody stem, oblong wrinkled leaves of a pale green color, and terminal, branching flower stalks. The flowers are small, but they grow compactly together in the spikes. The corolla is intersected at its mouth with fine folds, and is of a purple-lilac color, with a greenish white throat. Cuttings taken from the young branches readily grow, and come soon into blossom. Strong and large plants may be produced by training a single stem to the height of 3 or 4 feet, and then pinching the top so as to cause it to throw out numerous laterals, which will make a showy head. Several choice varieties have been raised by sowing the seeds, and by other means practised by amateurs. These are chiefly distinguished by the color, such as a lighter or darker tint in the corolla, a yellowish or pure white throat, technically called the eye of the flower, or else by the greater size of the spikes or "trusses." Another sweet-scented species grows wild in the Caucasian mountains, known by its herbaceous stems, ovate, flat-lined, finely tomentose leaves, and its spreading calyx; it is the *H. Europæum*, and is indigenous also to the south of Europe. This species, according to Prof. Gray, has become an adventitious weed in Maryland and Virginia. In the islands of the archi-

pelago and in Greece is found the *H. villosum*, with a very villous stem, woolly leaves, and large white flowers having yellow eyes. The genus *heliotropium* or turnsole contains more than 80 species, natives of the warmer regions in all parts of the world. The European heliotrope seems to have been known to the ancients, Pliny and Dioscorides asserting that its flowers turned toward the sun, whence its generic name. It was however called *verrucaria* by the Latins, from the notion that its expressed juice mixed with salt was excellent in curing warts. The flowers of the sweet-scented kinds are largely used by the perfumers, and their other properties seem to be merely mucilaginous and astringent. The cultivation of the heliotropes is easy. To grow them successfully, heat, moisture, and a plentiful supply of stimulating manures are needed. Some writers have recommended the elevated temperature of the stove or hothouse for the Peruvian heliotrope; and they are found to flower best when the plants are set in the warmest parts of the greenhouse, where they can be exposed to the sun and light.

HELIX (Gr. ἑλῖξ, a whorl or coil), in architecture, a spiral winding around a central axis, according to some authorities without approaching it, in which case it would be designated a spiral. The little volutes under the flowers of the Corinthian capital are also called helices.—In conchology, a genus of the family *helicidæ*, of the order *gasteropoda*. The family includes the genera of land snails, numbering 17 in Pfeiffer's monograph; but their various synonyms enumerated in the same work are no less than 330, and Dr. Albers of Berlin has added to these 100 new generic names. The shell of the whole family is distinguished for its size, being capable of containing the entire animal; it is provided with an epiphragm or layer of hardened mucus, by which the aperture is closed during hibernation. The head of the animal is provided with 4 tentacles, the upper and longer pair having eye specks at their summits. Some species of the genus *helix*, of which above 1,200 are known, are found wherever trees grow; they are most abundant in calcareous districts of warm, humid climates. The Neapolitans, French, Swiss, and Brazilians make use of them for food. By the Romans the *H. pomatia*, or great vine snail, was considered a delicacy, and by great care was fattened till it attained an extraordinary size. As fossils, about 50 species are met with in the eocene formation in Europe, all of which are extinct. Several curious instances are recorded illustrating the tenacity of life of these creatures. A specimen of *H. desertorum* from Egypt was fixed to a tablet in the British museum, March 25, 1846; on March 7, 1850, it was observed that the paper was discolored, evidently from the animal having come out from the shell. It had, however, returned, and the aperture was closed with the usual glistening film. Being placed in warm water, it became lively, and so continued.—In electro-magnetism, a helix is a coil of wire

wound around any body which is to be magnetized by the passage of the electric current through the wire. The power is increased with the number of turns, the wire being insulated, so as to prevent lateral discharge, by winding cotton thread about it.

HELL, MAXIMILIAN, a Hungarian astronomer, born in Schemnitz, May, 15, 1720, died in Vienna, April 14, 1792. At 18 years of age he entered the society of the Jesuits, and in 1745 was made assistant astronomer at the observatory in Vienna belonging to the order, and keeper of the museum of experimental philosophy recently formed in that city. In 1751 he took holy orders. Subsequently he filled the chair of mathematics in the college of Klausenburg in Transylvania for 4 years, and was in 1756 appointed astronomer and director of the new observatory in Vienna. In April, 1768, at the invitation of the court of Denmark, he undertook a journey to Vardöehus in Lapland for the purpose of observing the transit of Venus over the sun's disk, June 3, 1769, in which he succeeded perfectly. His chief work is a series of *Ephemerides*, commenced with *Ephemerides Anni 1757 ad Meridianum Vindobonensem Calculis definita*, and continued by himself and others to the year 1791 (35 vols. 8vo., Vienna). He published a variety of other astronomical works.

HELLAS, and HELLENES, the names applied by the ancient Greeks to their country and themselves. (See GREECE.)

HELLE, a daughter of Athamas, king of Thebes, by the goddess Nephele. When her brother Phrixus was about to be sacrificed, the mother rescued him, and placing the two children on the back of the ram with the golden fleece, which she had received from Mercury, fled with them to Asia; but between Sigeum and the Chersonesus Helle fell into the sea, and thenceforward that part of it into which she had fallen was called Hellespontus, the sea of Helle.

HELLEBORE, in pharmacy, the roots of the various species of the genus *helleborus*, of the natural order *ranunculaceæ*, and of the *veratrum album* and *V. viride*, natural order *melanthaceæ*. The black hellebore, *helleborus niger*, is a plant growing wild in the mountainous parts of southern and central Europe, and cultivated in gardens for the sake of its beautiful rose-like flowers, which bloom in midwinter and give to the plant the name of the Christmas rose. In the United States its time of blooming is the spring. The fibres of the roots are used for preparing the extract, decoction, or tincture. They are exceedingly acrid and burning to the taste, when fresh producing inflammation and even vesication on being applied to the skin. The extract is a drastic purgative and emetic, but it is at present seldom prescribed, except as an emmenagogue. Until the discovery of the *H. orientalis* it was supposed to be the same that furnished the black hellebore or *melampodium*, a famous medicine with the ancient Greeks and Romans, who used it in the belief that it gave clearness and activity to the mental faculties;

and the most celebrated philosophers are said to have drunk its infusion for this purpose. It was also employed in mania, dropsy, and various other affections.—*H. fetidus*, or bear's foot, is a perennial European plant of extremely acrid properties, a powerful emetic and cathartic, and long used in Great Britain as a domestic remedy for worms. It has even been known to cause the expulsion of the tapeworm.—White hellebore is the rhizoma of *veratrum album*, an herbaceous plant, indigenous to the Alps and Pyrénées, and imported from Germany. Its virtue resides in the alkaloid, veratrine, which imparts to it the properties of an emetic and cathartic. But it is so powerful and violent in its operation, that its use is now limited to external applications. (See VERATRINE.) It acts as a general stimulant to the secretions, and diluted with other substances is found to be a beneficial application in cases of gutta serena, lethargic affections, and some cutaneous diseases.—American hellebore is the rhizoma of *V. viride*, or Indian poke, a common plant in the swamps and meadows of the northern and middle states. It resembles the European species in its violent action as an emetic, and also in stimulating the secretions. It acts powerfully upon the nervous system, producing vertigo and dimness of vision, and dilating the pupils; the pulse is reduced to 35 beats in a minute. Its application is principally to gout, neuralgia, and rheumatism; and it is at present attracting much attention from physicians.

HELLER. I. JOSEPH, a German historian of art, born in Bamberg, Sept. 22, 1798, died there, June 4, 1849. Among his principal works are: *Monogrammenlexikon*; *Geschichte der Holz-Schneidekunst*; *Handbuch für Kupferstech-Sammler*; and biographies of Lucas Cranach and Albert Dürer. The 2d vol. of the latter work, in 3 parts, appeared in 1827-'31, but the 1st and 3d vols. have not been published. II. KARL BARTHOLOMÄUS, a naturalist and traveller, born in Moravia in 1824, explored Mexico for the Vienna horticultural society, and became in 1851 professor of natural history at Gratz. He has published *Reiseberichte aus Mexico* (Vienna, 1846), *Reisen in Mexico* (Leipzig, 1853), and several other works. III. STEPHAN, a composer, born in Pesth, May 15, 1813, perfected his musical education at Vienna and Augsburg, and spent some time in Paris. His principal compositions are for the piano, and have gained for him many admirers, especially in Germany. His *Pensées fugitives*, for the piano and the violin, contain 10 pieces, which he composed in concert with Ernst.

HELLESPONT (Gr. Ἑλλησποντος, sea of Helle), in ancient geography, the narrow strait (now the Dardanelles) connecting the Ægean sea with the Propontis (sea of Marmora), and separating the Thracian Chersonesus (peninsula of Gallipoli) from Asia Minor. (See DARDANELLES, and HELLE.)

HELM. See STEERING APPARATUS.

HELMERS, JAN FREDERIK, a Dutch poet,

born in Amsterdam in 1767, died Feb. 26, 1813. His principal work is his national poem "Holland" (Amsterdam, 1812; new ed. 1821). He published a collection of his poems (2 vols., Amsterdam, 1809-'10), and his posthumous writings appeared in Haarlem in 1814-'15.

HELMET, a piece of armor to protect the head. Originally, the helmet was made of leather or skin, frequently strengthened and adorned with bronze or gold, and was sometimes simply fitted to the shape of the head, without crest or ornament. These were commonly used in hunting, but the necessity of a stronger defence for the head in war caused the introduction of metallic helmets. From the middle of the 14th to the beginning of the 17th century helmets were worn with visors, which could be raised or lowered at will. Helmets are still worn in some services, especially by cavalry and artillery soldiers.

HELMONT, **JOHN BAPTIST VAN**, a Belgian physician and chemist, born in Brussels in 1577, died near Vilvoorden, Dec. 30, 1644. He was educated at Louvain, and was intended for the church, but abandoned the study of divinity for that of medicine. His chemical skill, and his acquaintance with the virtues of herbs and plants, gained him extensive practice; and so extraordinary were some of his cures considered, that he was at one time arrested and arraigned before the inquisition as a dealer in magic. He was the first to employ the term gas in its modern sense. He published during his life several works, now of little value; and his posthumous works were published in 1648 by his son, Francis Mercurius (1618-'99), author of "Paradoxical Discoveries concerning the Macrocosm and Microcosm" (London, 1685).

HELMSTEDT, or **HELMSTÄDT**, a fortified town of Germany, in the duchy of Brunswick, 20 m. E. from Brunswick; pop. 6,500. It contains 5 squares, 2 churches, a town house, gymnasium, several schools, 3 hospitals, and an edifice which was an important university until 1809, when it was abolished. The chief manufactures are flannel, hats, soap, vinegar, and liqueurs. There is also a considerable trade in cattle.

HELMUND, or **HELMEND** (anc. *Etymänder*), a river of Afghanistan, which rises between the two ridges of the Pughman mountains, 35 m. W. of Cabool, at an elevation of over 11,500 feet above the level of the sea. After flowing S. W. for the greater part of its course, it gradually sweeps round to the N. W. and W., and entering the plain of Seistan, discharges its waters by several branches into the lake of Hamoon, or Zarab. Its entire length exceeds 400 m. The principal tributaries are the Kashrood, Urghundab, Turnak, and Arghusan. In dry seasons the Helmund has a tolerable volume of water; but when swollen by the melting of the mountain snows, it is equal to the Jumna.

HÉLOÏSE, abbess of the Paraclete, born probably in Paris in 1101, died at the convent of the Paraclete, Champagne, May 16, 1164. Of her parentage nothing is certainly known. In

1116 she was living with her uncle Fulbert, canon of Notre Dame, on the island of the Cité in Paris, in a house the last portions of which were lately removed. At this time Pierre Abelard was at the height of his renown as a teacher, and Fulbert invited him to complete the education of his niece. The teacher and pupil fell in love with each other, and Abelard was compelled to conceal their mutual guilt by conducting his pupil to the home of his parents in Brittany, where she became the mother of a son, who was christened Pierre Astrolabe. Confessing his offence to Fulbert, he offered to cancel it by an immediate marriage, which was performed in the presence of several witnesses, and immediately afterward the couple were separated. Héloïse, unwilling to hinder her lover's advancement in the church, denied the marriage, and when Fulbert tried by ill treatment to make her acknowledge it, she fled to Abelard, who placed her in the convent of Argenteuil, where she had been educated. Fulbert resolved on sanguinary vengeance, and one night, in company with several relatives, he made violent entrance into the house of Abelard and inflicted upon him a shameful mutilation. In despair, Abelard hastened to bury himself in the cloisters of St. Denis, and Héloïse at once took the vows in the convent of Argenteuil, of which she soon became abbess. Here she remained for 9 or 10 years, until a decree of the king, confirmed by the pope, alienated the property of this among other convents, and compelled the nuns to find a retreat elsewhere. The vacant oratory of the Paraclete in Champagne, where Abelard had for some time lived as a hermit, invited them; and on the news of their misfortune, it was formally made over to them by Abelard, at that time abbot of a monastery in Brittany, and Héloïse became the first of a long line of noble abbesses. Some years later a papal bull confirmed the gift. The rule adopted by the new convent was that of St. Benedict; but Abelard became the spiritual adviser and the father confessor of his friend, and added some statutes of his own to the ancient rule. Only one personal interview was held; but a correspondence arose which was continued for several years, and recalled the days of the former passion. On the side of Héloïse, the letters breathed the spirit of love refined and purified; and whatever the theme on which she will consult her friend, it is evident that she cares more for the testimony of his affection than for the mere word of his advice. The death of Abelard took place in 1142, and his body, at the request of Héloïse, was transported from the abbey of St. Marcel, the place of his death, to the convent of the Paraclete. Héloïse lived 22 years longer, devoting herself wholly to the enlargement and the discipline of her religious house. She was universally regarded as a saint, and gifts of every kind were brought to her convent. Her remains, after many removals, have rested since 1820, with those of her husband, in the cemetery of

Père la Chaise in Paris. The letters of Héloïse and Abelard have been many times published. The most complete edition of the originals is by Victor Cousin (4to., Paris, 1849). They form a unique monument of the middle ages, and their authenticity is proved by the impossibility of their forgery. The letters of Héloïse especially are called by Hallam, "the first book that gives any pleasure in reading produced in Europe for 600 years, since Boethius's 'Consolations.'"

HELOS, a town of ancient Greece, in the territory of Laconia, situated in a fertile plain near the Eurotas and the sea. Its foundation was ascribed to Helius, the youngest of the sons of Perseus, and in very early times it appears to have been the principal town of that region. On being taken by the Dorians, its inhabitants, as a punishment for the obstinacy of their resistance, were reduced to slavery, and their name, according to some writers, became in time the general designation of the Spartan bondmen. In the age of Strabo Helos had dwindled into a small village, and in that of Pausanias it was a heap of ruins. Its probable site was not at Priniko, as Leake supposes, but near Bizani, where there are some Hellenic remains.—Helos at the present day is the name of a district in the plains on the banks of the Eurotas, extending from the mountain of Bizani to the frontier of Maina. Most of the villages of the district are situated on the low hills which encircle the plain.

HELOTS (Gr. ἑλωτες), slaves of the Spartans, serfs bound to the soil, and tilling it for the benefit of the proprietors. The 3 classes in Sparta were the Spartans, the Perioeci, and the helots. The first two were united together, and constituted one national aggregate, known by the common name of Lacedaemonians; but the last was for ages an entirely separate and inferior class. There are several derivations given of the name helots, including that from Helos, the Laconian town, but perhaps the most probable is that from the verb ἔλειν, to take, making the name signify captives. They had probably resisted the Dorian invasion, and, being taken prisoners, were reduced by the victors to slavery. They were regarded as the property of the state, which reserved the power of emancipating them, and were attached to the soil, each Spartan citizen receiving the number that belonged to his allotment of land, without any power to sell or free them. With the exception of the few who lived in the city as domestic servants, the helots occupied rural villages apart from their masters, and with only the obligation to till the land, and pay a certain proportion of the produce to their masters as rent. The amount of rent was 82 medimni (about 120 bushels) of barley and a proportionate amount of wine and oil for each allotment, which was inhabited by 6 or 7 families. This rent had been established at a very early period, and any increase of the amount was imperatively forbidden. Their number has been variously esti-

mated, but it is certain that, though few at first, they increased through the conquest of rebel towns, till they far exceeded the Spartans themselves. Müller computes their number to have been about 224,000, at a time when the Spartans numbered but 156,000. They were liable to be called upon to serve in time of war, generally as light armed troops, and a certain number of them attended on each Spartan. They were also in later times much employed in the navy. Only on particular emergencies did they serve as heavy armed troops, and then they were generally emancipated after the war. The manumitted helots were not however received into the Perioeci, but still were a separate class, under the name of Neodamodes, or newly enfranchised. Particularly liable to suspicion, they were often employed on foreign service, or among the different trades at Sparta. At the end of the 2d Messenian war (668 B. C.), the Messenians were reduced to slavery and incorporated with the helots. In 464 B. C. the helots revolted, and taking arms marched directly against Sparta, which they nearly succeeded in taking. After long and obstinate struggles, they were finally subdued. The helots were constant subjects of apprehension to the Spartans, and were sometimes cruelly massacred in order to keep down their numbers, the young men being sent out secretly to slaughter them. The most noted of these massacres was in 424 B. C., when 2,000 of the helots who had rendered distinguished services in war were treacherously put to death.

HELPS, ARTHUR, an English author, born about 1817. He was educated at Trinity college, Cambridge, where he was graduated bachelor of arts in 1835, and, after holding for several years an office in one of the departments of civil service, retired to his estate in Hampshire, where he has since devoted himself to literature. His earlier publications, all of which appeared anonymously, are: "Thoughts in the Cloister and the Crowd" (London, 1835); "Essays written in the Intervals of Business" (1841); two dramas entitled "King Henry II." and "Catharine Douglas" (1843); and the "Claims of Labor" (1844). A work which much enhanced his reputation as a subtle thinker and graceful writer was entitled "Friends in Council; a Series of Readings and Discourses thereon" (1847; 6th ed., 2 vols., 1854), a collection of essays with conversations interspersed. It was followed by a similar work entitled "Companions of my Solitude" (1851). His "Conquerors of the New World, and their Bondsmen" (2 vols., 1848-'52) was enlarged into the "Spanish Conquest in America" (3 vols., 1855-'7; republished in New York, 1856-'7), in which he narrates the origin and growth of negro slavery. All his writings are marked by a philosophical tone and moral fervor, and Ruskin confesses his obligations, in respect to style, to "the beautiful quiet English of Helps." His latest work is a second series of discussions under the title of "Friends in Council" (1859).

HELSINGFORS, a city of Russia, capital of the grand duchy of Finland, situated on the gulf of Finland, 100 m. E. S. E. from Abo; pop. 16,000. It was founded by Gustavus I. of Sweden in the 16th century, burned by the Russians in 1728 and again in 1741, and finally ceded to them with the whole of Finland in 1809. After the destruction by fire of the town of Abo, the capital of Finland, the government was transferred to Helsingfors (1819), and a few years later the town was almost rebuilt. The streets were laid out with great regularity, public buildings were erected, and from a small and rather insignificant place it has risen to be a large and handsome city, and a strongly fortified naval station of Russia. It has a fine harbor, capable of containing 60 or 70 men-of-war, protected by the fortress of Sveaborg, which is built on 7 islands, and is sometimes called the northern Gibraltar on account of its great strength, the whole presenting a front of about a mile in length, and mounting about 800 cannon, with a garrison stated at 12,000 men. In 1827 the emperor Nicholas removed the university of Abo to Helsingfors. It is now called the Alexander university, and has 4 faculties, 22 professors, and generally about 400 or 500 students. In the senate house is a large and valuable library. Beside this, the town contains a military academy with about 140 students, a Finnish society of art and one of science, fine museums of mineralogy and zoology, botanical gardens, an observatory, which was partly destroyed by fire in 1845, and several journals, of which the *Finnland's Allmänna Tidning* and the *Helsingfors Tidningar* are the most important. There are manufactories of linen, sail cloth, and tobacco. The exports are fish, iron, timber, and grain. The trade in grain and in naval stores is especially active during the summer, when the town is also visited by many strangers for sea bathing. The town was blockaded during the Crimean war, was bombarded Aug. 5, 1855, and was seriously damaged by a fire in 1858.

HELST, BARTHOLOMEUS VAN DER, a Dutch portrait painter, born in Haarlem in 1613, died in Amsterdam in 1670. His picture in the stadthouse at Amsterdam, representing 30 full length figures of a train band, with the Spanish ambassador in the midst, was called by Sir Joshua Reynolds "the first picture of portraits in the world." He occasionally painted historical pictures, but his reputation rests almost exclusively upon his portraits, which are numerous in the Netherlands.

HELVELLYN, a mountain of Cumberland, England, between Keswick and Ambleside. It is one of the highest mountains in England, its summit being 3,055 feet above the sea.

HELVETII, an ancient people of Celtic origin, who in historical times occupied the country between the Rhine, the lake of Constance, the Rhone, the lake of Geneva, and the Jura; that is, somewhat less than the territory of modern Helvetia or Switzerland. They first appear in history toward the close of the 2d

century B. C., when one of their divisions, the so called *pagus Tigurinus*, joined the Cimbri on their march to invade Italy, and defeated the Roman consul Lucius Cassius (107). After the defeat of the Cimbri and Teutons by Marius, they retired to their territory, where they numbered 12 towns and 400 villages. They left it again at the time of the first triumvirate, invading Gaul, which had been assigned as a province to Cæsar, under the command of Orgetorix, one of their chiefs. Cæsar routed them at Bibracte (Autun in Burgundy), and the survivors returned beyond the Jura. Numerous Roman castles and colonies were now planted in their land, which was known under the name of *Ager Helvetiorum*, until it was attached to Transalpine Gaul. Having refused to acknowledge Vitellius as emperor, they were rigorously chastised by his generals. After that time the Helvetii almost disappear as a people. Their territory was occupied by the Alemanni, and in its S. W. part by the Burgundians during the last period of the West Roman empire. (See SWITZERLAND.)

HELVETIUS, CLAUDE ADRIEN, a French philosopher, born in Paris in Jan. 1715, died Dec. 26, 1771. His grandfather, whose name Schweitzer was afterward converted into Helvetius, was descended from a noble German family, and gained a high reputation as a physician, and dabbled in alchemy. His father was also a distinguished medical man, and was attached to the household of Queen Maria Leszczyńska of France. When scarcely 23 years old, Helvetius was appointed farmer-general, with an annual revenue of about \$60,000. He became the patron of philosophers, wits, and men of letters, whom he invited to his table and treated with princely liberality. He visited Voltaire at Ferney, Buffon at Montbard, and Montesquieu at the chateau of La Brède. His official duties did not hinder him from cultivating literature, science, and philosophy; but in order to devote himself exclusively to these favorite pursuits, he resigned his office in 1750, married a few months later the countess de Ligneville, and led with his wife a more retired life, mostly at his country seat of Voré, in the province of Perche. Here, while engaged in the composition of his philosophical works, he labored to improve the condition of the peasantry. In 1758 he published anonymously, under the title *De l'esprit*, a free and bold exposition of materialism, the last word, as an eminent French historian designates it, of the philosophical movement of his age, which was translated into the principal foreign languages. The work was proscribed by the pope, the Sorbonne, and the parliament, and burned by the common hangman. Helvetius bore this visitation with philosophic equanimity, and lost nothing of his popularity at home, while it increased abroad. "For we must not forget," says Louis Blanc, "that Helvetius had a generous soul and virtues which refuted his doctrine." When he subsequently visited England and Germany, kings,

princes, nobles, and literary men vied with each other to welcome him; he was treated with special distinction by Frederic II., who received him in his own palace. On his return to Voré, he completed a poem, *Le bonheur*, in 6 cantos, and a philosophical treatise, *De l'homme, de ses facultés intellectuelles et de son éducation*, both of which were published after his death, the latter by Prince Gallitzin (1772). The best edition of his complete works is that published under the supervision of Lefebvre de La Roche, by P. Didot (14 vols. 18mo., Paris, 1795).—His wife, who contributed so much to make his life happy and his home agreeable to friends and visitors, survived him; she retired to Autenil, near Paris, and her house was still open to philosophers. She was visited here by Franklin and the most distinguished men of her time. On her death, Aug. 12, 1800, aged 81, she bequeathed her property to her friend, the celebrated physician Cabanis.

HEMANS, FELICIA DOROTHEA, an English poetess, born in Liverpool, Sept. 25, 1794, died near Dublin, May 12, 1835. Her father, a merchant named Browne, was a native of Ireland, but on her mother's side she was of Venetian descent. When she was 5 years of age commercial disasters compelled the family to remove to an old mansion at Gwrych, in Denbighshire, Wales, where her childhood was passed. She began to write poetry before the age of 10, being encouraged thereto by her mother. A collection of her juvenile poems was published in 1808, under the title of "Early Blossoms," but met with such harsh treatment from the critics that the authoress was affected to illness. A 2d volume, entitled "The Domestic Affections," published in 1812, was more successful, and encouraged her to pursue a literary career. In the same year, being then a lovely girl, with golden hair and a face radiant with poetic enthusiasm, she was married to Capt. Hemans, by whom she became the mother of 5 sons. Incompatibility of tastes and temperaments rendered the union an unfortunate one, and when Capt. Hemans went to Italy in 1818 to recover his health by a residence in a more genial climate, it was tacitly understood that the separation would be permanent. From that time they never again met, although letters frequently passed between them with reference to the education of their children. Mrs. Hemans now rejoined her mother in Wales, and commenced an active literary life. She studied German and the languages of southern Europe, translated from Camoëns and Herrera, and contributed numerous pieces in prose and verse to the magazines and annuals. About this time she published "Tales and Historic Scenes," "Modern Greece," "Dartmoor," a prize poem, and "The Sceptic." At the suggestion of Reginald Heber she wrote her play of "The Vespers of Palermo," which failed on the London stage, notwithstanding the exertions of Kemble and Young, but was well received in Edinburgh soon afterward. Her works fol-

lowed in rapid succession, and gained her the friendship of many distinguished men. She visited Scott at Abbotsford and Wordsworth at Rydal Mount, leaving with each the impression of a singularly lovely and accomplished woman. In 1831, after a temporary residence near Liverpool for the benefit of her children, she went to reside in Dublin, where one of her brothers was living. Her health, always delicate, suffered by the change, and after a severe attack of scarlet fever in 1834 she sank rapidly, and died with gentle resignation. Her last poem was a "Sabbath Sonnet," dedicated to her brother. In 1839 appeared the first collective edition of her poems, with a memoir by her sister (7 vols. 12mo.), followed in 1848 by one chronologically arranged (1 vol. 8vo.), and by another in 6 vols. in 1850. In 1836 were published "Memorials of Mrs. Hemans," by H. F. Chorley (2 vols. 12mo.). Her popularity in the United States dates from 1826, when an edition of her poems, accompanied by a notice of the authoress, was published by Prof. Andrews Norton. Numerous editions have since appeared, including one in 1850, with an essay on her genius by H. T. Tuckerman. She highly appreciated her American reputation, and several of her minor pieces were suggested by characters or passages in American history.

HEMATITE, a name applied to varieties of two species of iron ore, viz., to the red fibrous variety of specular iron, to which it properly belongs from the blood-like color of its powder, and to a variety of hydrous peroxide of iron or limonite, distinguished by the name of brown hematite, an ore of various shades of brown and yellow passing into black, and giving a yellowish powder. (For an account of the specular ores, see *IRON*.) In the United States the name hematite is commonly applied to the brown ore, which is well known and highly prized throughout the iron ore district lying east of the Alleghanies and extending from Canada to Alabama, as described in this work, vol. i., p. 706. Brown hematite is similar in its composition to the bog ores and ochres into which it passes by imperceptible gradations; ochres in fact are produced by roasting and pulverizing it. When pure it consists of iron 4 equivalents = 108, or 59 per cent.; oxygen, 6 equivalents = 48, or 26.3 per cent.; water, 3 equivalents = 27, or 14.7 per cent.; total, 183, or 100 per cent.; a composition represented by the formula $2\text{Fe}_2\text{O}_3 + 3\text{H}_2\text{O}$. It is rarely, however, met with unimixed with silicious and aluminous matters, oxide of manganese, and phosphoric acid. It also contains oxide of zinc in quantity too minute to be detected by chemical tests, but which gathers upon the inner walls of the furnaces, and forms thick deposits in the course of a long blast. (See *CADMIUM*.) Sulphur is occasionally present in the form of iron pyrites; but generally the ores are free from it. The following analyses are: 1, of a specimen from a solid bed of ore in Chittenden, Vt.; 2, of a black manganesean

variety from Wallingford, Vt., both by Denison Olmsted, jr.; 3, of one of the varieties at West Stockbridge, Mass., by Dr. A. A. Hayes; and, 4, of a specimen from the *Amenia* ore bed, Dutchess co., N. Y., by Dr. Lewis C. Beck:

Constituents.	1.	2.	3.	4.
Peroxide of iron.....	84.90	71.30	76.18	82.90
Peroxide of manganese.....	....	12.93	6.94	trace
Phosphoric acid.....	....	....	2.36	....
Silica.....	0.75	3.00	3.40	3.60
Alumina.....	0.47	trace	....	....
Water.....	13.88	12.50	10.50	13.50
Total.....	100.00	99.73	98.78	100.00
Metallic iron.....	58.66	49.84	52.82	57.48

The ore occurs in deposits of ochres, clays, and sands, of massive forms, as ledges, and in loose imbedded nodules and blocks of various shapes, due apparently to the action of water. Some present the form of stalactites in glossy jet black needles of pure hematite, while some are botryoidal and mammillary. Their structure is often close and compact, resembling that of bones, a texture which adapts them for burnishing tools, in which service they are called bloodstones. Among the best varieties of the ore are masses of a honeycomb structure, light and porous, of a reddish color, and easily broken in pieces. Portions of these are often of chocolate brown color, the structure fibrous, in ribboned layers or in diverging rays. The pieces often look like petrified wood, and break with hackly fracture, not unlike wood partially rotten. The pure mineral is of specific gravity 3.6 to 4; its hardness is 5 to 5.5. Exposed to heat, it loses water and becomes black and usually magnetic.—The deposits in which the brown hematite is usually found are of obscure character and origin. The materials of which they are principally composed are obviously those of contiguous rock formations, micaceous and talcose slates, and quartz rock. These are reduced in part to clays, which by their micaceous or talcose character testify to the source from which they came, and in part to silicious sands, evidently a product of the quartz rock; with these are intermixed fragments of the rocks themselves, and the bodies of hematite. These materials usually lie against strata of the metamorphic limestone, one of the members of the same group with the slates and quartz rock, and follow it along its course sometimes for half a mile, the limestone often forming a prominent narrow ridge, its strata dipping at a high angle in the direction of the ore beds, so as in fact to underlie them. A slate ridge is sometimes found next the ore, but limestone is almost invariably very near. Evidences of stratification, somewhat obscure, may usually be observed in the arrangement of the materials of the deposits, conformable to that of the underlying formation. The deposits extend downward to unknown depths, retaining the same feature of irregular distribution of their materials so far as they have been followed. In many places this exceeds 100 feet. In Berks

co., Penn., the Moslem ore bed has been worked 165 feet deep; and the workmen say that at the bottom the ore fails and the slate formation is struck. The same statement is often incorrectly made at other beds, when it becomes difficult to work them by reason of the increased influx of water or other causes consequent upon the depth. There is therefore nothing known with certainty as to the depths these deposits reach. Their width is little better understood. A few hundred feet usually intervene between the limestone and any rock on the other side of the ore bed; but the contact of the deposit with the overlying stratum is everywhere obscure. Toward this the ore is rarely found in quantity sufficient to justify its exploration. The *Amenia* ore bed already referred to is an exception to this, however, as massive bodies of hematite are worked in an open vertical cut 70 or 80 feet deep close up to a ridge of mica slate, the strata of which dip away from the ore. The associations and characters of the hematite ores point to their having been brought together from some former condition, and deposited like bog ores in the elongated basins in which they are now found. Yet the want of a directly stratified arrangement, with the ores forming the lowest layers, may suggest their being like the bodies of hematite that form the "backs" of the copper lodes of the eastern Tennessee mines, and like the "gossans" everywhere the products of the decomposition of pyritous beds occupying the same position. To this hypothesis is opposed the fact, that when worked below the reach of atmospheric causes of change no increase of sulphur is detected, and no marked difference in the qualities of the materials. The depressions in which the materials were received are an extraordinary feature to be repeated with such uniformity along the great extent of the range of the metamorphic rocks. Their almost universal connection with limestone suggests the possibility of their being "limestone sinks," a common feature in calcareous districts. The period in which they were filled is altogether obscure. From a single instance of a bed containing lignite and other fossil vegetable matters being found in the same deposit with the hematite, President Hitchcock supposes their origin may be referred to the period of the upper tertiary. (See BROWN COAL.) Along the same range of metamorphic rocks hematite is also found occasionally in the form of beds included between the strata of the slates, under the same conditions apparently as the specular and magnetic ores with which it is associated. In the highlands, 10 m. E. of Peekskill, N. Y., a regular stratum of hematite 4 feet and more thick has been worked 30 or 40 feet below water, in the metamorphic slates, dipping with them at a steep angle toward the east. The ore is of the best quality, and affords no evidence of becoming sulphurous below, as if it were the result of superficial changes upon pyritous materials. In South Carolina, however, as appears from the report of Prof.

Tuomey, hematites are met with under conditions in which they seem to have been thus produced, and are observed to become sulphurous 20 feet below the surface, and to some extent magnetic. In the Allatoona hills, Cass co., Ga., the writer examined in 1842 beds of hematite of excellent quality and extraordinary dimensions, which could be traced in several parallel belts among the hills, following for miles a general course N. by E., S. by W., and dipping with the layers of granite and mica and talcose slates at a steep angle toward the east. The surface was frequently covered with blocks of the ore over a width of from 50 to 150 feet, and sometimes even of 300 feet. Specular iron was met with upon some of the hills.—The hematites are not limited to the group of metamorphic rocks; but in the middle states they are also found in deposits of comparatively unimportant though often workable dimensions, in the limestones and shales from the lower silurian to the coal measures; and in the last named they are sometimes met with in beds, as at Mt. Savage, Md., which appear as if they were the argillaceous carbonates of this formation altered by exposure to atmospheric agents of change. Thus these ores appear to occur under two conditions: 1, in beds, the original materials of which have undergone a change of character without being removed from their place; and, 2, in deposits the materials of which have been gathered from neighboring sources.—The hematites constitute some of the most valuable mines in the world. Mines of gold and silver have produced greater profits in a short time; but none of these have been the source of such long continued and uniform prosperity to the country around them as such deposits of ore as the Salisbury bed of Connecticut, the great group of the Chestnut hill mines in Columbia co., Penn., and the famous ore beds of Lehigh and Berks counties in the same state. Though belonging to a class of mineral repositories not regarded as inexhaustible, the Salisbury beds have been worked more than 100 years, enriching generations of proprietors, giving value to the water power and other resources of the region, and creating a wholesome industry by supplying material for numerous furnaces and forges. The greater portion of all the iron made in the United States is probably from hematite ores. They are generally mined at little expense, worked easily in the blast furnace, produce a good yield, and make excellent qualities of iron whether for foundry or forge purposes. Being often deficient in the silicious matters required to make a glassy cinder, the magnetic oxides, which have commonly more or less quartz intermixed, are advantageously employed with the hematites in the proportion of one third or one fourth of the whole charge of ore. The hematites are extracted in the form of clear coarse lumps, and in fine ore which is mixed with the associated clays and other foreign matters. This is subjected to a process of washing in a current of water or in a cylindrical revolv-

ing cage of iron through which a current of water is made to flow, washing the earthy particles through the lower end, as the lumps are worked upward by the action of blades set obliquely to the axis of the cylinder. The fine ore discharged at the top of the cylinder is called wash ore. For charcoal furnaces the lump ore is usually subjected to a process of roasting in open heaps, by which it is better prepared for the reduction process. This is not so important in the large anthracite furnaces.

HEMIPTERA, an order of insects, including what are generally called bugs, harvest flies, tree hoppers, plant lice, &c. They are sucking insects, having neither mandibles nor maxillæ proper, but a horny beak, curved along the breast when not in use, containing in its groove delicate sharp bristles by which their punctures are made. They have 4 wings, of which the upper are generally thick at the base and membranous at the ends, being as it were half elytra and half wings, whence the name of the order (from *ἥμις*, half, and *πτερον*, wing); in a few all the wings are membranous, and some are wingless, as the bed bug. The eyes are large, the antennæ generally small, and the tarsi in most 3-jointed. They undergo a partial transformation, the larvæ and pupæ resembling the adults except in the absence of wings and the smaller size; in all the stages they live in the same way, and in all are equally active. The bugs or true *hemiptera* (*H. heteroptera*) have the semi-opaque wing covers laid horizontally on the top of the back, crossing each other obliquely at the end; their wings are horizontal and not plaited; the beak issues from the fore part of the head, and is bent abruptly backward beneath the breast. English entomologists have separated the harvest flies, tree hoppers, plant lice, &c., under the name of *H. homoptera*, because the wing covers are of the same texture throughout, either transparent or opaque; they do not cross each other, are not horizontal, but with the wings are more or less inclined at the sides of the body; the beak issues from the under side of the head; the insects of this division live on vegetable juices, while those of the preceding live also upon animal fluids. In the 1st division, the family *geocorisæ* (Latr.), or earth bugs, have the antennæ exposed and longer than the head; most are terrestrial, but some live on the surface of water; many emit a disagreeable odor. The genus *pentatoma* (Oliv.), or wood bugs, occur chiefly in the warm countries, where they attain a considerable size, and are marked with brilliant colors; they live on vegetable juices, and sometimes on those of other insects; they exhale a disagreeable odor, and adhere to whatever they touch; De Geer relates that the young of the *P. griseum* (Linn.) in troops of 30 or 40 follow their mother on trees as chickens follow a hen. In the genus *coreus* (Fab.) the head is generally triangular, sunk without apparent neck into the thorax; the eyes small but prominent; the legs long and slender; they

feed both on vegetable and animal juices, exhale a strong odor, and present often strange forms and spiny armature. Here belongs the well known squash bug (*C. tristis*, De Geer), whose odor when handled is too powerful to be agreeable. In the genus *lygæus* (Fab.) belong the chinch bugs, so destructive in the fields of corn and wheat at the South and West; the white-winged species (*L. leucopterus*, Say) is provided with wings, and measures about $\frac{3}{10}$ of an inch in length; the general color is black, with white wing covers margined with black, and reddish yellow legs, beak, and hinder edge of thorax; the young and wingless ones are bright red—described in the "Prairie Farmer" for Dec. 1845, and Sept. 1850. Plant bugs of the genus *phytocoris*, of small size, are very destructive in flower and vegetable gardens; one species in particular enters into the long list which have been erroneously supposed to produce the potato rot. The genus *syrtis* (Fab.) have a single claw on the anterior feet, with which they seize flies and other insects; the "tiger" so destructive to pear trees in Europe belongs to the genus *tingis* (Fab.); the bed bug (*cimex lectularius*) has been described under EPIZOA; a species of *reductus* is destructive to the cotton crop, staining the balls red, and causing them to fall prematurely; *hydrometra* and some allied species run upon the surface of water, and have been found in considerable numbers in mid ocean in the tropics. In the family *hydrocorisæ*, or water bugs, belong the genus *nepa* (Linn.), commonly called water scorpions, from having the anterior legs in the form of hooked nippers; they prey upon other insects, and are very voracious; in some tribes the posterior legs are much ciliated, resembling oars, enabling them to swim with great swiftness, and often on their backs.—In the homopterous division, the 3 principal tribes are the *cicadada*, already described under HARVEST FLY; *aphididæ*, or plant lice, noticed under APHIS; and the *coccidæ*, or bark lice, described under COCHINEAL. In some of the *cicadada*, according to Dufour, the stomach or chylic ventricle is remarkably long, with many convolutions of an intestine-like tube ascending and reopening into its cavity—a remarkable physiological fact. The lantern fly (*fulgora*), said to give forth a light from the end of its prolonged snout, has been alluded to under FIRE-FLY. The tree hoppers (*membracis*, Fab.) have the habits of the harvest flies; but they make no drumming sound, and leap and fly to a considerable distance, even to 250 times their length; in the same proportion a man should be able to vault through the air to the distance of a quarter of a mile; they pass their time on plants, always placed lengthwise of the limbs, with the head toward the end of the branches; from their conical shape, dark color, and fixed position, they look much like the thorns of a tree; locust and oak trees and many vines suffer from the abstraction of their sap by these insects and from the injury done to their leaves. Tree hoppers are often surrounded by ants, for the

sake of their droppings or for the sap which oozes from their punctures. The frog hoppers (*cercopis*, Fab.) possess still greater leaping powers; the larvæ extract the sap of alders, willows, &c., in such quantity, that it oozes from their bodies continually in little bubbles, whose white foam completely covers them during the period of their transformation; this is called frog spittle and cuckoo spittle. The leaf hoppers (*tettigonia*, Geoffr.) are very small, but handsome, agile, and destructive to vegetation; vines, rosaceous plants, beans, &c., suffer much from their exhausting punctures; tobacco fumigations and the application of whale oil soap in solution are the best remedies. Some plant lice have the power of leaping, though both sexes, when mature, are winged; these belong to the genus *psylla* (Geoffr.), live on pear and other trees, sucking the juices of the young twigs, and are far less prolific than the *aphides*; these sap suckers are attended by swarms of ants and flies, attracted by the sweet fluid which flows from their bodies; young trees are often killed by them. From the family *coccidæ* are obtained the scarlet grain and cochineal of commerce, now ascertained to be insects or bark lice of the genus *coccus* (Linn.) (see COCHINEAL); the mealy bug of our greenhouses is the *C. Adonidum*; the *C. hesperidum* infests the myrtle. These lice are destroyed by the wren, chickadee, and ichneumon flies; strong soap and alkaline solutions will also kill them.

HEMLING, or more properly MEMLING, HANS, a Flemish painter, born probably in or near Bruges between 1425 and 1435, died probably in Spain shortly subsequent to 1500. According to Kugler, he was the scholar of Roger of Bruges, and one of the best artists of the school of Van Eyck. He is supposed to have visited Italy and Germany in middle life, and is said to have served Charles the Bold of Burgundy in the twofold capacity of painter and soldier. After the battles of Granson (1476) and Morat (1476), in which he followed the fortunes of his patron, he gained admittance into the hospital of St. John in Bruges, penniless and disabled by wounds, and, out of gratitude for the attentions which he received, painted for the institution some of his finest works. Two of these, altarpieces with wings, are inscribed with his name and the date of the year, 1479. In the chapel of the hospital is also the celebrated reliquary of St. Ursula, a shrine about 4 feet in length, on the longer sides of which in 6 compartments is painted the history of the saint. These pictures are among the most interesting productions of the Flemish school. Of the 100 pictures by Hemling which Rathgeber enumerates, but a small number are probably genuine, and these are among the most precious specimens of early Flemish art.

HEMLOCK, a vegetable poison, the nature of which is now unknown, much used by the ancient Athenians for the execution of criminals, and famous as the means employed for putting Socrates to death. It is supposed by some to

have been the *conium maculatum*, a wild umbelliferous plant, from 5 to 10 feet high, with fern-like leaves and greenish white flowers, naturalized in the United States, and possessing highly narcotic properties; by others to have been the *cicuta virosa*, a plant somewhat resembling the former in appearance and effects, but more dangerous.

HEMLOCK SPRUCE. See FIR.

HEMORRHAGE. See HEMORRHAGE.

HEMORRHOIDS. See HEMORRHOIDS.

HEMP, the common name of the annual plant *cannabis sativa*, natural order *cannabinacea*, and also of the tough fibre obtained from its stem and employed chiefly in the manufacture of cordage. The name is also applied to various other fibres of different genera of plants. Thus the so called Manila hemp is not a true hemp, but a fibre obtained from the leaves of the *Musa textilis*, a species of wild plantain, which grows in great abundance in the Spice and Philippine islands, where it is used by the natives for manufacturing cloth and cordage. It is largely imported into the United States, and spun into the so called grass or Manila rope. It is collected, separated from the vegetable tissue, and dried somewhat in the manner of ordinary hemp. Jute hemp is a product of two species of *corchorus*, *C. capsularis* and *C. olitorius*, plants allied to the linden tree. Its use is particularly for coarse bagging. The Sunn hemp of Hindostan, known also by various other names, is obtained from the *crotonaria juncea*, and resembles the Jute, being somewhat coarser and stronger; it is well known in commerce as the material of gunny cloth. Many other fibres answering the purposes of hemp are obtained in the East Indies, and among them that of the *caloce* or *rheca*, the product of *Boehmeria nivea*, is reputed to be both stronger and cheaper than the genuine hemp of Russia. But it is questionable whether, after being worn out in the form of rope, the material can afterward be converted to any other useful purpose, as for making paper or oakum. It is this quality that gives additional value to genuine hemp, and is wanting in Manila and the other white fibres. Upon the American continent are also found various plants which produce fibres designated as hemp. The so called Sisal hemp, including the Pita, Sosquil, and others, grows wild and is also cultivated in Yucatan. It is the product of several species of agave and aloe, and resembles in its qualities Manila hemp. It is largely employed in the manufacture of coffee bags. In 1837 its cultivation was introduced into the United States, and in Florida, where the plants have become naturalized, the leaves have grown to the length of 10 feet, and produced fibres superior to those of Manila hemp.—Indian hemp (*C. Indica*) must be carefully distinguished from *apocynum cannabinum*, which in the United States has the same trivial name. Botanists find that there is no characteristic difference between it and *C. sativa*, but that it is a mere variety pro-

duced by difference of climate. It has been long used among eastern nations as a nervous stimulant, and in India is spoken of as the "increaser of pleasure, the exciter of desire, the causer of a reeling gait, the laughter mover," &c. (Royle, "Botany of the Himalayan Mountains"). In the East several different preparations of the plant are ordinarily found in commerce. The *hashish* of the Arabians consists of the tops and tender parts of the plants collected immediately after inflorescence. *Gunjah* and *bang* are Indian preparations; the former consists of the stems, leaf stalks, and leaves, dried and pressed together in masses about the size of the finger, while the bang is composed of the larger leaves and capsules of the plant. *Churrus* is an intoxicating resinous substance which exudes from the branches, leaves, and flowers. This is collected by its adhering to the leathern garments of men, who run in hot weather through the hemp fields, brushing off the secretion by the violence of their movements. The purest of this material, called waxen churrus, is carefully collected by hand. In medicine, an alcoholic extract and a tincture are employed. Indian hemp calms pain and relieves spasms, without causing either constipation or loss of appetite. In large doses it causes a peculiar kind of intoxication, which in some cases is attended with soothing and agreeable reverie, in others with a disposition to exhalation, laughter, singing, and dancing. Occasionally it renders its devotee quarrelsome and disposed to violence. A condition resembling catalepsy has likewise been produced. After the first effects pass off, there is left a tendency to sleep. Its continued employment seems to impair the intellect and to produce insanity. The Hindoos and Arabians are much more susceptible of its influence than northern Europeans or Americans. Of the medicinal preparations, the dose of the alcoholic extract is from 1 to 5 grains; of the tincture, from 10 minims to a dram.—The true hemp plant belongs to the nettle tribe. It grows from 4 to 10 feet high, and the stalk is rough, consisting of a woody core surrounded by a fibrous gluey covering. At what time or where this was first used for spinning or weaving is not known. The Scythians are said by Herodotus to have manufactured fine garments from it, and it is supposed to be indigenous in India, whence it spread westward into Europe, and finally to America. In cold climates the plant possesses less of the narcotic quality, and is more valued for its fibre, which is tougher and stronger, and more suited to the manufacture of cordage and canvas, than is that of plants grown in hot climates. Hemp of slender fibre suitable for canvas grows very well upon a poor soil; but when cultivated for heavy cordage it requires a very rich soil, of which it takes full possession, excluding every weed. The tall slender plants which bear flowers alone also produce fine elastic fibres, while those bearing the fruit and growing together with the others are of coarser and tougher material. The former also come to maturity sooner

than the latter, and are sometimes gathered by themselves, the stalks being pulled up by the roots. These and also the tops are cut off, and the stalks are tied into bundles. The gathering of the other plants is sometimes 4 weeks later. The separation of the long fibres that constitute the woody portion of the stalk is effected by the process of retting or rotting, similar to that described under FLAX; the stems are however dried both before and after this process. The effect of the retting is to dissolve the vegetable glue that holds the fibres together, and to decompose the cellular tissue of the bark and medulla that covers the fibres, and render it easy of removal by the subsequent processes of breaking or beating with mallets, scutching, and hatchelling. Various methods of retting are practised, as by exposing the dried stems to the action of water in ponds or streams, or by leaving them under the snow. The fine Italian garden hemp and the Marienburg hemp are acted upon by the dew.—The principal hemp-producing countries are Russia, Italy, Holland, Turkey, Great Britain, the East Indies, and the United States. St. Petersburg exports this product largely, receiving it from various parts of Russia. It is stated that for the English and American markets alone from 20,000 to 30,000 tons have been annually exported, and during the Crimean war its value increased from \$200 to more than \$600 per ton. Special attention is given in St. Petersburg to its storage and shipment, and great care is taken to prevent the bundles from becoming damp, in which condition the hemp would be liable to ferment as in the retting process. The best Russian hemp is said to be that of Riga, which is brought down the Duna. English hemp is chiefly woven into coarse sheeting and shirting for laboring men, and into the cloth called huckaback, of which coarse towels and table cloths are made. The material improves in whiteness as it is worn, and the finer varieties of it much resemble Irish linens.—Attempts were made at a very early period to cultivate both flax and hemp in the Plymouth colony, the seeds being ordered there in 1629. In Virginia hemp was grown and spun by Capt. Matthews previous to 1648. In 1651 its culture was encouraged by bounties offered by the government, as was that of flax in 1657. But the greater profit derived from tobacco has always operated against the culture of hemp. In Pennsylvania also the bounties offered by the government of the colony in 1730 failed to render this an important crop. Its culture has proved most successful in Ohio, Kentucky, and Indiana, and more recently in Missouri. It has also prospered to considerable extent in the other northern, and in the north-eastern states. In the northern part of New York the crop is valued chiefly for the seed, of which from 20 to more than 40 bushels are obtained to the acre, and the value of which is from \$3 to \$6 per bushel. It produces a drying oil, which is used by painters, and for burning in lamps. From 20 to 25 parts of oil, it is stated, are obtained from

100 of seed. But little American hemp has ever been exported. The amount raised in the Union in 1853 has been estimated at 34,000 tons, worth \$100 per ton. The product to the acre is from 700 to 1,000 lbs. It is customary to cultivate in separate fields the plants grown for the seed and those for the fibre; and in the former case the seed is sown in drills, in the latter broadcast. The seed plants are cut after the first sharp frost, either late in September or early in October; and they easily shed their seeds under the flail. The stalks are too coarse and harsh to serve any other purpose than to make charcoal for the powder mills. The plants grown for the fibre are generally ready to be gathered about the middle of August. They are either pulled or reaped close to the ground, and in either case are left a few days spread about to cure. They are then bundled and stacked, and if they are thus left in the field a year or more, the quality of the fibre appears to be improved. In Kentucky dew rotting is commonly practised. Water rotting is thought to produce better hemp, but want of water in September, and a prejudice against handling the water-rotted plants, are obstacles in the way of the general adoption of this practice. Dew rotting is conducted from the middle of October to the middle of December. In February and March the hemp which had been bundled and left in the field or under sheds is broken and dressed, generally in the open air by a large fire. The machine employed is the common hand brake, similar to that used for flax. The cultivator thus separates the woody particles from the fibre, but generally leaves the further process of scutching for the manufacturer. Much of the crop is consumed in the neighboring villages, where the hemp is converted into cotton bagging, bales, and cordage. Its average value is from \$4 to \$5 per 100 lbs., and at the latter price it is considered the most profitable of all crops.—Hemp possesses several valuable properties beside those already named. The plant is said to be so repellent to noxious insects, such as caterpillars, that when sown as a border around cabbage plantations, these vegetables are entirely protected from their ravages. The seeds not only furnish the oil mentioned above, but an emulsion is obtained from them which is usefully applied in inflammation of the mucous membranes. They serve also as an excellent food for birds; and in Russia and Poland they are moreover bruised or roasted, mixed with salt, and eaten upon bread by people of all classes. To some extent the hemp fibre has been spun in Great Britain, as before remarked, for the purposes of linen. The same application of American hemp has recently been made at the mills in Massachusetts, as appears by publications of Nov. 1859. Owing to the deficient supply and inferior quality of flax furnished to the mills, hemp is now employed to a considerable extent as a substitute. Refuse flax or hemp is also prepared by some process to resemble cotton, and is successfully employed in-

terwoven with this fibre to produce fabrics said to be equal in appearance and durability to those of cotton alone. As a medicine, the extract of hemp is a powerful narcotic, resembling opium except that it does not constipate the bowels nor check the secretions. It is recommended in cases of neuralgia, gout, rheumatism, convulsions, mental depression, &c.

HEMPEL, CHARLES JULIUS, an American physician and writer on medicine, born in Solingen, Prussia, Sept. 5, 1811. He studied medicine in Paris, and in 1835 emigrated to the United States, where he has since resided. He was graduated at the university of New York, and subsequently practised medicine in that city according to the system of Hahnemann, whose therapeutical views he had adopted previous to his arrival in America, and whose principal works as well as those of others of that school he has translated and edited. In 1857 he was appointed professor of materia medica and therapeutics in the homœopathic medical college of Pennsylvania, at Philadelphia, where he now resides. Among his publications are, a "Grammar of the German Language" (2 vols. 12mo., New York, 1842), and "True Organization of the New Church" (12mo., 1848), the latter an attempt to show that the doctrines of Swedenborg, if fully developed, must lead to an organization of society similar to that proposed by Charles Fourier. On medical subjects he has published translations of Hahnemann's *Materia Medica Pura* (4 vols. 8vo., 1846); of Jahr and Possart's "New Manual of the Homœopathic Materia Medica" (8vo., 1849); of Jahr's "New Manual" (2 vols. 8vo.), to which a third volume was added by Dr. Hempel as a separate work, under the title of "Complete Repertory of Homœopathic Materia Medica" (1853), &c. His most recent work is entitled "A Comprehensive System of Homœopathic Materia Medica and Therapeutics" (8vo., 1859).

HEMPSTEAD, a S. W. co. of Ark., bounded N. E. by the Little Missouri, and S. W. by Red river; area, 1,330 sq. m.; pop. in 1854, 6,892, of whom 2,636 were slaves. The surface is hilly, the soil sandy and fertile. The productions in 1854 were 341,230 bushels of Indian corn, 5,277 of wheat, 43,245 of oats, and 17,424 bales of cotton. Red river is navigable by steamboats. Capital, Washington.

HEMSTERHUIJS, TIBERIUS, a Dutch critic and philologist, born in Groningen in 1685, died in Leyden, April 7, 1766. He was the son of a physician of Groningen, and entered the university of that place at the age of 14 years. At 19 years of age he was appointed professor of mathematics and philosophy at Amsterdam. While there he published his edition of the *Onomasticon* of Pollux (1706). In 1717 he was made professor of Greek at Franeker, and in 1740 professor of Greek history at Leyden. He introduced into the study of Greek what has been called the analogical method. His writings are few, but remarkable for great research and study; among them are editions of *Luciani*

Colloquia et Timon (1708); the "Plutus" of Aristophanes (1744); "Notes and Emendations on Xenophon of Ephesus" (1784). His life has been written by Ruhnken (Leipsic, 1768 and 1789; new ed. by Lindemann, 1822).—FRANS, a philosopher, son of the preceding, born in Leyden in 1720, died at the Hague in 1790. He was in the service of the United Provinces as first assistant to the secretary of state. He devoted much of his time to the study of philosophy, and his complete philosophical works were published in Paris (1792).

HEN. See Cock.

HENBANE (*hyoscyamus*, Tournefort), a somewhat rare but highly dangerous weed, belonging to the nightshades (*solanaceæ*), seen in waste places, rubbish heaps, and on the sites of old houses; remarkable for a singular beauty of its flowers, as well as for its fetid, viscid stems, and clasping, sinuate-toothed, and angled leaves. There are many species of henbane, but the one most common in the United States is an adventitious weed from Europe, the *H. niger* of botanists. Its seeds are small, flat, kidney-shaped, resembling beans, and suggesting the classic name of *hyoscyamus*, i. e., swine beans, being, it is said, eaten with impunity by the hog, though avoided by other creatures. A very powerful extract is procurable from them, and an alkali which crystallizes in acicular forms, having a silky lustre. Its action is extremely narcotic and fatal, like nicotine. The leaves are usually employed in medicine, and they are sometimes smoked to cure the toothache. The principal use made of *hyoscyamus* in medicine is as a substitute for opium, in cases where that article disagrees with the patient, or is contra-indicated by particular symptoms. It has been favorably employed in nervous diseases. It is however rather a secondary medicine, to be resorted to after the failure of opium. It is also used in the form of a poultice in cancer and glandular swellings.

HENDERSON, the name of 5 counties in the United States. I. A S. W. co. of N. Carolina, bordering on S. Carolina, bounded S. by the Blue Ridge, and drained by French Broad river; area, 425 sq. m.; pop. in 1850, 6,853, of whom 924 were slaves. The surface is hilly, and the soil adapted chiefly to grazing. The productions in 1850 were 163,186 bushels of Indian corn, 559 of wheat, 450 lbs. of tobacco, and 49,907 of butter. There were 21 churches, and 1,680 pupils attending public schools. Capital, Hendersonville. II. A N. E. co. of Texas, bounded E. by the Neches and S. W. by Trinity river; area, 934 sq. m.; pop. in 1858, 3,585, of whom 827 were slaves. The surface is undulating and the soil fertile and well watered. The productions in 1850 were 31 bales of cotton, 31,350 bushels of Indian corn, and 4,453 of sweet potatoes. There were 121 pupils attending public schools. Value of real estate in 1853, \$226,400. Capital, Athens. III. A W. co. of Tenn., drained by Beech and Big Sandy rivers; area, 780 sq. m.; pop. in 1850, 13,164, of whom

2,592 were slaves. It has a nearly level surface, is well timbered, and has a fertile soil, suitable for grain, grass, and the vine. The productions in 1850 were 562,280 bushels of Indian corn, 70,553 of oats, 5,212 bales of cotton, 65,720 lbs. of tobacco, and 66,898 of butter. There were 30 grist mills, 7 saw mills, 9 churches, and 800 pupils attending public schools. Capital, Lexington. IV. A N.W. co. of Ky., separated from Ind. on the N. by the Ohio river, and drained also by Green river; area, 725 sq. m.; pop. in 1850, 12,171, of whom 4,397 were slaves. It abounds in coal, has a hilly surface, and is fertile in grain and tobacco. The productions in 1850 were 926,865 bushels of Indian corn, 71,618 of oats, 4,292,960 lbs. of tobacco, and 16,259 of wool. There were 4 saw mills, 2 newspaper offices, 15 churches, and 511 pupils attending public schools. A railroad has been projected to pass through this county, connecting Nashville, Tenn., with a point on the Ohio opposite Evansville, Ind.; and another to run from the town of Henderson to the junction of the Ohio and Cumberland rivers. Value of real estate in 1855, \$2,507,559. Capital, Henderson. V. A W. co. of Ill., bordering on Iowa, bounded W. by the Mississippi, and drained by Henderson river and other streams; area, 390 sq. m.; pop. in 1855, 7,128. It has a diversified surface, occupied by fertile prairies and tracts of timber. The productions in 1850 were 352,840 bushels of Indian corn, 121,775 of wheat, 52,622 of oats, and 2,813 tons of hay. There were 4 grist mills, 6 saw mills, 1 newspaper office, 7 churches, and 500 pupils attending public schools. Coal and limestone are found. The Peoria, Oquawka, and E. Burlington railroad passes through the county. Capital, Oquawka.

HENDRICKS, a central co. of Ind., drained by Whitelick and Eel rivers; area, 389 sq. m.; pop. in 1850, 14,083. It has a level and well timbered surface, and a fertile soil. The productions in 1850 were 775,539 bushels of Indian corn, 80,814 of wheat, 75,154 of oats, and 4,934 tons of hay. There were 20 grist mills, 36 saw mills, 11 tanneries, 1 newspaper office, 33 churches, and 3,176 pupils attending public schools. The Terre Haute and Richmond railroad passes through the county. Capital, Danville.

HENFREY, ARTHUR, an English botanist, born about 1800, studied at St. Bartholomew's hospital to prepare himself for the medical profession. As early as 1844 he published his work on "Anatomical Manipulations," in which he had been assisted by Mr. Tulk. He afterward devoted himself exclusively to botany, and published in 1847 his "Outlines of Structural and Physiological Botany," subsequently the "Rudiments of Botany," and in 1852 "The Vegetation of Europe," a condensed view of the botany of Europe. In 1857 appeared his principal work, "An Elementary Course of Botany, Structural, Physiological, and Systematic, with a Brief Outline of the Geographical

and Geological Distribution of the Plants." The "Micrographic Dictionary," which he edited in concert with Dr. Griffith, and to which he contributed all the articles on vegetable physiology, was also completed in 1857. Mr. Henfrey is an active contributor to scientific periodicals, has translated many botanical works from the German, and constructed the maps and wrote the letterpress on the geographical distribution of plants in Johnston's "Physical Atlas." He is examiner in natural science to the royal military academy and to the society of arts, is a fellow of the royal and Linnæan societies, and in 1854 succeeded Edward Forbes as professor of botany at King's college, London.

HENGIST, in English history, the name of a Jutish prince, founder of the kingdom of Kent, who is said to have died about 488, but whose very existence is doubted by recent historians. He was a reputed descendant of Woden, and in company with his brother Horsa, having sailed on a marauding expedition with some 300 men in 3 vessels, landed in 449 on the British coast at Ebbsfleet, near Richborough, in the isle of Thanet. Finding the British chieftains in need of assistance against the Picts and Scots, the Saxons agreed to assist in repelling the northern invaders, and, having been reinforced by 1,300 of their countrymen, they defeated them with such slaughter as effectually put a stop to their incursions, and the Britons hoped thenceforth to enjoy peace under the protection of the valiant Saxons. Hengist and his brother, however, perceiving the feebleness of their employers, forthwith sent envoys to their native country, who returned shortly with an army of 5,000 men. They brought with them also the princess Rowena, the daughter of Hengist, who acted as cup-bearer at a feast given by her father to Vortigern, the principal British king. Vortigern became enamored of the Saxon beauty, and demanded her in marriage, to which Hengist consented. The Britons, alarmed at all these proceedings, intimated to their auxiliaries that the time was now arrived for their departure. Hengist and Horsa upon this threw off the mask, allied themselves with the northern tribes whom they had lately repelled, and made war upon the Britons, spreading havoc and desolation, according to the venerable Bede, from the "East sea to the West." The Britons formed a more vigorous system of defence, and, having deposed Vortigern, marched under the leadership of his son Vortimer. Hengist and Horsa were defeated in 3 battles, Horsa was slain in action at Englesford, now Aylesford (455), and Hengist then withdrew to his native country. The death of Vortimer was the signal for Hengist's return. His forces were much augmented, but it is related that he had recourse to perfidy in order to obtain a footing. He is represented as soliciting a treaty of peace with his son-in-law Vortigern, who had been restored to power among the Britons. The latter, trusting in the honor of the Saxon, invited his people to a great feast at Stonehenge,

where, on a signal from Hengist, a fearful massacre took place. The life of Vortigern was spared; but the result was the speedy conquest of the whole southern country. Meanwhile, Ambrosius, a Briton of Roman descent, endeavored to reunite his countrymen. Hengist received large reinforcements, under the command of another brother named Octa, and of Ebissa the son of Octa, who occupied Northumberland. He remained himself in the south, completing his conquests in a great battle at Crayford, in 457. The Britons fled in terror to London, having lost the flower of their warriors in this defeat, and abandoned Kent. The kingdom which bore this name under Hengist is said to have consisted of the county so called, Middlesex, Essex, Sussex, and part of Surrey, though Sharon Turner restricts it to Kent proper. The victor established his court at Canterbury, and reigned about 30 years. The Britons meanwhile had made several desperate exertions to expel him. Their last effort (473) was conclusive of their destinies, as, suffering a more signal defeat than ever, they are declared to have fled from the Saxons as from fire. The romantic character of the British tradition of these two princes has been fully established by modern historians; and Lappenberg has shown in his "History of England" that the Anglo-Saxon stories on the subject are also purely mythical.

HENGSTENBERG, ERNST WILHELM, a German theologian, born in Fröndenberg, Westphalia, Oct. 20, 1802. He studied philology, especially the oriental languages, at Bonn, where he belonged to an association of liberal and progressive students. In 1823 he went as a private tutor to Basel. In 1824 he became *Privatdocent* of theology at the university of Berlin, and soon gained the reputation of being one of the ablest representatives of the orthodox theology in Germany. In 1826 he became extraordinary professor, and in 1828 ordinary professor of Old Testament exegesis at the same university. He soon acquired a commanding influence in the church by the publication of the *Evangelische Kirchenzeitung* (1827), which marks a turning point in the history of the German Protestant church. It was started as the common organ of the evangelical party in the church and the conservative aristocratic party in the state. Among its founders and contributors were a large number of the most celebrated names in Germany, including Otto and Ludwig von Gerlach, Neander, Tholuck, Lange, Huber, Stahl, Vilmar, and Leo. Hengstenberg, however, soon fell out with the theologians who were attached more to evangelical-biblical than orthodox Lutheran principles, and his journal became more and more the organ of a high church Lutheran party. He opposed the revolutions of 1848 and 1849; and after the success of the counter-revolution in Prussia in 1849, he was believed to rule, by his influence, in union with Stahl and Gerlach, both church and state. This influence ceased

when, in Nov. 1858, the prince regent appointed a new ministry. The policy of the new minister of public worship, Bethmann Hollweg, was considered by Hengstenberg as so disastrous to the best interests of the church, that he spoke of a secession of the whole Lutheran party from the state church as perhaps soon to become a necessity. The order of freemasons, although the prince of Prussia was known to be one of its chief patrons, was denounced by him in a series of severe articles as deistic and infidel. Hengstenberg's first work was a translation of the "Metaphysics" of Aristotle (1824). All his succeeding works were devoted to the interpretation of the Bible, and to the defence of its genuineness, integrity, inspiration, and divine authority, against the attacks of modern critical and sceptical schools. Most of them have been translated into English, and are published in Clark's "Foreign Theological Library." The most celebrated among them is his *Christologie des Alten Testaments* (Berlin, 1829-'35; 2d ed. 1854-'5; translated by Dr. R. Keith, 3 vols. 8vo., Alexandria, 1836-'9), containing a full exposition of all the Messianic prophecies. His *Commentar über die Psalmen* is regarded as a masterpiece of orthodox exegetical theology. It was translated into English, and furnished the groundwork for the more condensed commentary of Dr. Alexander of Princeton on the same book. His other works are: *Beiträge zur Einleitung ins Alte Testament* (3 vols., 1831-'9); *Die Bücher Mosis und Aegypten* (1841; English translation by R. D. C. Robbins, Andover, 1843); *Die wichtigsten und schwierigsten Abschnitte des Pentateuchs* (1842); *Commentar über die Offenbarung Johannis* (2 vols., 1850), which has been received with much less favor than his works on the Old Testament. He regards the millennium as something past, and dates it from the downfall of German heathenism to modern infidelity and revolutions.

HENKE, ADOLF CHRISTIAN HEINRICH, a German professor of medicine, born in Brunswick, April 12, 1775, died there, Aug. 8, 1843. For some time he practised his profession in his native city; in 1816 he became professor of physiology, pathology, and medical jurisprudence at Erlangen, and in 1818 of therapeutics and clinique. He was chiefly distinguished by his contributions to the science of medical jurisprudence. His *Lehrbuch der gerichtlichen Medicin* passed through 12 editions from 1812 to 1851. His *Zeitschrift für Staats-Arzneikunde* has been continued since his death, and since 1850 by Behrends. Among his other principal works are: *Handbuch zur Erkenntnis und Heilung der Kinderkrankheiten* (Frankf., 1809; 4th ed. 1837), and *Darstellung der Verbündeten gegen Napoleon in den Jahren 1813-'15* (4 vols., 1814-'16).—HERMANN WILHELM EDUARD, brother of the preceding, born in Brunswick, Sept. 28, 1783, has been since 1823 professor of jurisprudence at Halle. Among his principal works is his *Handbuch des Criminalrechts und der Criminalpolitik* (4 vols., Berlin, 1823-'8).

HENKLE, MOSES MONTGOMERY, an American clergyman, born in Virginia, March 23, 1798. In 1819 he entered the ministry, and became a missionary to the Wyandot Indians. In 1822 he conducted a religious magazine, and has often since been connected with the press. He was elected joint editor of the church paper at Nashville, Tenn., in 1845, and in 1847 established the "Southern Ladies' Companion," and edited it for 8 years. He has published a volume of masonic addresses (1848); "Primary Platform of Methodism" (1851); "Analysis of Church Government" (1852); "Life of Bishop Bascom" (1853); "Primitive Episcopacy" (1856).

HENLE, FRIEDRICH GUSTAV JAKOB, or according to some authorities, JULIUS, a German physiologist and anatomist, born in Fürth, Franconia, July 9, 1809. He studied medicine at Heidelberg and at Bonn, receiving his degree of doctor in the latter place in 1832, and subsequently went to Berlin, where, through the recommendation of Johann Müller, he was appointed assistant at the anatomical museum. In 1834 he became prosecutor to the medical faculty of the university, an office recently vacated by Müller; but having been convicted of affiliating with the secret societies of the students called the *Burschenschaften*, he was imprisoned, and, though soon after pardoned and released, was not able until 1837 to establish himself in the university as a private tutor. For 3 years he gave instructions in pathology and in microscopic anatomy, the latter a branch of science which he was the first to develop; and in 1840 he accepted the professorship of anatomy and zoology in the university of Zürich. Previous to this he had been a contributor to the "Annual Reports" of Canstatt, and had published *Ueber Schleim- und Eiterbildung* (Berlin, 1838); *Vergleichende Anatomie des Kehlkopfes* (Leipsic, 1839), describing the development of the larynx in animals, from man down to the lowest types of creation; and *Pathologische Untersuchungen* (Berlin, 1840), a series of observations on the nervous system, the periodical nature of certain maladies, miasma, &c. While at Zürich he aided Pfeuffer in establishing the *Journal de médecine rationnelle*. Between 1844 and 1852 he filled the chair of anatomy, physiology, pathology, and anthropology at Heidelberg, his lectures on the latter branch having attracted many pupils from all departments of the university. Within this period appeared his *Handbuch der rationellen Pathologie*, his most important contribution to science. Since 1852 he has been professor of anatomy and director of the anatomical institute at Göttingen. Belonging to the so called physiological school in pathology, he has defined his scientific position in an able review of former medical theories and methods, in which he also urges a systematic arrangement of the physiological facts which recent observations upon the body in disease have evolved. His employment of the achromatic microscope for anatomical purposes opened a wide and interesting

field of observation to scientific men. Among his remaining works are: *Handbuch der allgemeinen Anatomie* (Berlin, 1841), *Handbuch der systematischen Anatomie des Menschen* (3 vols., Brunswick, 1855), &c., the latter work ranking next in importance to his treatise on pathology.

HENLEY, JOHN, an English clergyman, better known as "Orator Henley," born in Melton Mowbray, Aug. 3, 1692, died Oct. 14, 1756. He was a son of the vicar of his native place, entered St. John's college, Cambridge, at the age of 17, and while an undergraduate addressed to the "Spectator" two letters of indifferent wit which were published in numbers 396 and 518. On leaving the university he taught school with reputation at Melton, and having taken orders was made assistant curate of the same parish. Soon afterward he resigned this position and went to London, where he was chosen assistant preacher at Ormond street and Bloomsbury chapels. In 1723 he obtained the living of Chelmondiston, Suffolk, with the privilege of non-residence; but reports having been spread damaging to his reputation, the bishop ordered him to remove to his parish, whereupon he resigned the living. He now rented a building in Newport market, and fitted it up as a place of worship. "The Oratory," as he called it, was opened in 1726, and for about 30 years he continued to lecture twice a week to large audiences, composed mainly of the lowest classes of the people. All except those who rented seats were charged a shilling for admittance. He endeavored to found a new sect to be called Henleyarians, and drew up a form of prayer under the title of the "Primitive Liturgy," discarding the Nicene and Athanasian creeds. He also conceived the idea of connecting with his system an enlarged course of liberal education under a corps of competent professors, of whom he should be the president, but the scheme was not carried out. For some time he edited a weekly journal of nonsense called the "Hyp-Doctor," designed to ridicule the arguments of the "Craftsman," for which he received from Sir Robert Walpole £100 a year. When this gratuity was withdrawn, he became so violent an opponent of government that in 1746 some adherents of the ministry broke up one of his Sunday evening meetings by force and caused him to be arrested, but he was soon set at liberty. He used to put forth the most preposterous announcements in order to attract hearers. On one occasion he advertised to teach shoemakers a short way of making shoes, which was by cutting off the tops of ready-made boots. He interlarded his orations with satire, invective, and buffoonery, and accompanied them with all the extravagances of a theatrical delivery—

Tuning his voice and balancing his hands;

his object being, as he said, to keep the congregation awake. He delighted in the title of "restorer of ancient eloquence," and Pope thus apostrophized him in the "Dunciad:—"

O great restorer of the good old stage,
Preacher at once and zany of thy age!
O worthy thou of Egypt's wise abodes,
A decent priest where monkeys were the gods!

Notwithstanding this character by which he is now almost exclusively known, Henley was a man of learning and a diligent student. He wrote a poem entitled "Esther," which is said to contain fine passages; a "Compleat Linguist, or an Universal Grammar of all the Considerable Tongues in Being" (8vo., London, 1719-'21); a "History of Sweden;" a number of pamphlets, various controversial pieces, and the "Oratory Transactions," published in numbers.

HENNA, a pigment obtained from a shrub of the genus *Lawsonia* (Willdenow), belonging to the natural order *lythraceæ*, found in Asia and Africa, of easy culture and propagation. The genus consists of but two species, *L. spinosa* and *L. inermis*. The latter is termed in Arabia the henna plant, and bears abundantly corymbose, white, and very fragrant flowers; the leaves are smooth, opposite, oval, and lanceolate. It is much cultivated in Egypt, and is exported from thence to Persia and the Indies. The pigment is yellow, and is obtained by powdering the dried leaves, and making them into a paste with hot water. It is used by women to color their nails and the ends of their fingers, and men frequently dye their beards with it, changing the yellow color to black by the subsequent application of indigo. The yellow color on the nails of some of the Egyptian mummies has by some been supposed to be derived from henna.

HENNEPIN, an E. co. of Minn., bounded E. by the Mississippi, N. by Crow river, and S. W. by the Minnesota or St. Peter's; pop. in 1857, 13,064. It has an undulating surface, covered with good timber, and contains Minnetanka lake. It was named in honor of the French missionary and explorer of this region, Louis Hennepin. Capital, Minneapolis.

HENNEPIN, LOUIS, a Franciscan (Recollect) missionary and explorer of the Mississippi river, born at Ath, Belgium, about 1640, died in Holland subsequent to 1699. After his entrance into the Franciscan order, his roving disposition was gratified by a tour through Germany and Italy, at the close of which he was settled for a year as preacher at Ilal in Belgium. His superiors then sent him to Artois, whence, after begging at Calais and Dunkirk, where he acquired a taste for the sea by loitering whole days around sailors' eating houses, he journeyed to Holland, and for 8 months had charge of a hospital at Maestricht. At the battle of Senef, between the prince of Condé and William of Orange, in 1674, he was present as regimental chaplain. The next year he was ordered to Canada, and embarked at La Rochelle in company with Bishop Laval, whose favor he managed to secure on the voyage, and with the sieur de la Salle. He preached for a while at Quebec, but his love of adventure seems to have been stronger than his taste for the ministry. In 1676 he went to the Indian mission at Fort Frontenac,

whence he visited the Five Nations and the Dutch settlement at Albany. In 1678, having returned to Quebec, he was attached to La Salle's expedition, and, in company with the chevalier de Tonty and the sieur de la Motte, was ordered to sail from Fort Frontenac to Niagara, and there construct a vessel for navigating the lakes above the falls. This accomplished, La Salle joined the party, and on Aug. 7, 1679, the adventurers began their voyage on Lake Erie. They passed through Lakes Erie, Huron, and Michigan, to the mouth of the St. Joseph's river, ascended them in canoes to the portage, carried their frail barks 5 or 6 miles by land to the Kankakee, and floated down this stream and the Iroquois to the Illinois, on the banks of which they built Fort Crèvecoeur near the present site of Peoria. After a delay of two months at this place, La Salle returned to Fort Frontenac for supplies, charging Father Hennepin with a voyage of discovery to the sources of the Mississippi, which had never been explored above the mouth of the Wisconsin. Accompanied by Picard du Gay and Michel Ako, he set out in a canoe, Feb. 29, 1680, followed the Illinois to its mouth, and ascended the Mississippi to the falls of St. Anthony, which he was the first European to see, and which he named in honor of his patron saint. This was on April 30. Arriving at the mouth of the St. Francis river, in what is now the state of Minnesota, he travelled by land about 180 miles along its banks, naming it in honor of the founder of his order, and visited the Sioux Indians, whom he mentions by the names Issati and Nadouessioux. He staid with them three months, being according to his own account held in captivity, and then, meeting a party of Frenchmen who had come into the country by way of Lake Superior, returned with them to Canada, descending the Mississippi to the Wisconsin, and passing up that river and down the Fox, and so through Green bay to Lake Michigan. From Quebec he sailed for France, where he published in 1683 his *Description de la Louisiane, nouvellement découverte au sud-ouest de la Nouvelle-France*, &c. (12mo., Paris), containing the fullest published account of La Salle's first expedition, a history of his second voyage, and of Hennepin's own explorations, with a description of the upper Mississippi. Notwithstanding the writer's vanity and fondness for exaggeration, the work is valuable. Hennepin was now appointed guardian of a convent at Renty in Artois; but refusing to return to America in obedience to his ecclesiastical superiors, he was compelled to leave France, and entered the service of William III. of England. He put off his clerical dress in Holland about 1697, but to the end of his life seems to have written himself: "Recollect missionary and apostolic notary." In 1697, 10 years after La Salle's death, Hennepin published his extraordinary *Nouvelle découverte d'un très-grand pays situé dans l'Amérique entre le Nouveau Mexique et la Mer Glaciale*, &c. (12mo.,

Utrecht), reprinted the next year under the title, *Nouveau voyage dans un pays plus grand que l'Europe*, &c. In this work, which embodies his *Description de la Louisiane*, written anew and enlarged, he claims to have descended to the mouth of the Mississippi, and to have been the first European who floated on that river. He gives a description of the scenery, Indian tribes, and distances along the route, with a minuteness which easily gained him credit for veracity, and explained his long silence on this important point by saying that he feared the enmity of La Salle, who had ordered him to follow a different course, and who prided himself upon his own claims as the first who descended the Mississippi to the gulf of Mexico. Notwithstanding the utter impossibility of reconciling the dates given in Hennepin's narrative, the story obtained general credence until its falseness was exposed by Mr. Jared Sparks. (See "Life of La Salle," by Sparks, in the "Library of American Biography.") Hennepin "is now remembered," says Bancroft, "not merely as a light-hearted, ambitious, daring discoverer, but also as a boastful liar."

HENNINGSEN, CHARLES FREDERIC, an English author and soldier, of Scandinavian extraction, born in 1815. In 1834 he entered as a volunteer the service of Don Carlos, the claimant of the Spanish throne. The war was then at its height, and young Henningsen speedily rose to be captain of Zumalacarrgui's body guard. On the conclusion of the convention negotiated by Lord Eliot and Col. Gurwood, he returned to England. He subsequently went back to Spain with the rank of lieutenant-colonel, and served with the Carlist forces in many engagements. He was attached to the expedition which marched on Madrid from Aragon, and after the battle of Villas de los Navarros, he was raised to the rank of colonel, and placed in command of the cavalry. When within 3 miles of Madrid, he was attacked by the queen's horse in great force, but finally succeeded in breaking the ranks of the enemy. A few days afterward he was taken prisoner, and released on parole not to serve again during the war. He next served in the Russian army in Circassia, on which territory he drew up an important military report. On his return to England, he wrote his "Revelations of Russia," translated into French by Cyprien Robert and published in Paris (3 vols., 1845). Now known by his writings as an anticzarist, he was welcomed by the insurrectionary leaders of Hungary, when the crisis in that country was approaching. A plan of campaign proposed by Henningsen was so highly approved of, especially by Gen. Guyon, that he was to be appointed military and civil commander of the fortress of Comorn. When the struggle was over, he visited Kossuth, then detained at Kutaieh, in Asia Minor. He next visited Italy, making the overland journey from Constantinople, passing through Albania, and crossing the Adriatic, under circumstances of great peril.

Henningsen reached the United States shortly after Kossuth, and remained here as a representative of Hungarian interests. When the contest in Nicaragua began to assume serious proportions, he was invited to join the forces of Gen. Walker; and having consented to do so on certain conditions, he was immediately on his arrival in that country appointed major-general. He remained with the army from Oct. 1856, until its surrender to Commander Davis, U. S. N., in May, 1857. He was second in command at the battle of the Transit, Nov. 11, and in the 3 days' combat at Masaya. Having thrown himself into Granada with 416 persons, 140 of whom were women, children, and wounded, he was surrounded by 2,800 troops of San Salvador and Guatemala, afterward increased to 4,000. Burning the city, he fought his way to the lake with a loss of 230 killed, wounded, or carried off by cholera; and there being joined by a reinforcement of 130 men, he routed the allies, inflicting on them an enormous loss. He commanded at the battle of Obraje, and was second in command at the 3d and 4th battles of San Jorge. He directed the defence of Rivas, March 23 and April 11, when the allies who penetrated into the town were all killed or captured. Gen. Henningsen is now a citizen of the United States, and is married to a niece of the late John Macpherson Berrien, for many years U. S. senator from Georgia. His speciality in arms is artillery, but he has also given great attention to the improvement of small arms, having in fact superintended the construction of the first Minié rifles ever made in the United States. He is the author of "Twelve Months' Campaign with Zumalacarrgui;" "The White Slave," a novel; "Eastern Europe;" "Sixty Years Hence," a novel of Russian life; "Analogies and Contrasts;" and various other works, all published in London.

HENRICO, a S. E. co. of Va., bounded S. W. by James river, and N. E. by the Chickahominy; area, 291 sq. m.; pop. in 1850, 43,572, of whom 16,109 were slaves. The surface is diversified with hills of no great height; bituminous coal abounds in the W. part, but most of the soil is light and poor. The productions in 1850 were 266,011 bushels of Indian corn, 113,044 of wheat, 83,832 of oats, 2,196 tons of hay, 338 bales of cotton, 66,615 lbs. of butter, 400 of tobacco, and 3,615 of wool. There were 10 grist mills, 5 saw mills, 32 tobacco factories, 1 iron foundry, 4 machine shops, 1 paper mill, 1 woollen factory, 4 coal mines, 15 newspaper offices, 44 churches, 859 pupils attending public schools, and 1,123 attending other schools and academies. The James river and Kanawha canal has its E. terminus in this county, and 4 railroads, viz., the Virginia central, the Richmond and Danville, the Richmond, Frederic, and Potomac, and the Richmond and Petersburg, radiate from Richmond, the capital of the state and county. Value of real estate in 1856, \$7,294,729, showing an increase of 71 per cent. since 1850.

HENRIETTA ANNA OF ENGLAND, duchess of Orleans, daughter of the succeeding and of Charles I. of England, born in Exeter, June 16, 1644, died at St. Cloud, June 29, 1670. When her mother left England, she was confided to the care of Lady Morton, who succeeded in bringing her safely to France. There she was educated as a private person rather than a princess, making a very indifferent figure at the French court. Young Louis XIV. declined her hand, under pretence that she was too young (he would not say too poor and ugly) for him. A few years afterward she had become the most fascinating princess in Europe. On the restoration of her brother Charles II. to the throne of England, she repaired to his court, and in March, 1661, was married to Philip, duke of Orleans, the youngest brother of Louis XIV. She now became the centre of attraction in the French court, and even inspired the king with something more than brotherly affection. Though this does not seem to have overstepped the limits of propriety, it brought about an estrangement between Henrietta and her husband, which was embittered by her subsequent intrigue with the count of Guiche. In 1670, when Louis XIV. was anxious to win Charles II. over to a friendly neutrality, if not to an alliance, he sent Henrietta to England, and she fulfilled her mission to his entire satisfaction. On her return to St. Cloud she died suddenly in great suffering, after drinking a cup of chiceroy water. It was then rumored that she had been poisoned; and a favorite of her husband, the chevalier of Lorraine, who had been exiled at her request, was pointed out as the promoter, if not the direct author of the crime. Her funeral oration was delivered by Bossuet, and her biography was written by Mme. de Lafayette.

HENRIETTA MARIA OF FRANCE, queen of England, born in Paris, Nov. 25, 1609, died Sept. 10, 1669. She was the youngest child of Henry IV. of France by his second wife, Maria de' Medici, and had much of her father's wit and courage, joined to some youthful beauty. James I. demanded her hand for his son Charles, and the marriage ceremony took place by proxy at Paris a few days after Charles's accession to the throne, May 21, 1625. Henrietta, welcomed with great kindness by her husband, became obnoxious to the English nation by her undisguised partiality for the Catholic faith. She was moreover charged by the king's opponents with being the adviser of his arbitrary policy, and the enemy of English liberties. Her unpopularity was increased by her participation in the strife between Charles and the parliament. In 1643 she repaired to Holland, and procured money and troops which she undertook to bring to England. Notwithstanding a violent storm, which drove her fleet toward the continent, she finally succeeded in landing her forces at Burlington, and, after escaping many dangers, joined her husband at Oxford. In 1644, a few days after being delivered of Henrietta Anna, her last child, at Exeter, she narrowly escaped

being taken prisoner by Essex, and went to Falmouth, whence she sailed to France on board of a Dutch ship. Her health had been seriously impaired, and after the death of her husband was never entirely restored. She also suffered from the civil troubles of France, and led a sad life until Charles II. was recalled to England in 1660. She paid him a visit with her daughter Henrietta Anna, but soon returned to France, where she continued in retirement at her house in Colombes, near Paris. She died suddenly, and her remains were buried in the abbey of St. Denis, with the exception of her heart, which was intrusted to the nuns of St. Marie de Chailot. Bossuet delivered a funeral oration in her honor. The private correspondence of Henrietta and Charles I. during the civil war was published in 1857, edited by Mrs. Green.

HENRIQUEL-DUPONT, LOUIS PIERRE, a French engraver, born in Paris, June 13, 1797. After attending for several years the school of Pierre Guérin, the painter, he took to engraving under the direction of Bervic. His works number about 70, the principal of which are a full length portrait of a lady and her daughter after Vandyke (1822); Gustavus Vasa, after Hersent (1831), the more valuable since the original painting was destroyed in 1848 at the *palais royal*; a full length portrait of Louis Philippe, after Gérard (1837); "Lord Strafford on his Way to the Scaffold," after Delaroche (1840); "Christ the Consoler," after Scheffer (1841); portrait of Peter the Great of Russia, after Delaroche (1842); the "Hemicycle" of the *palais des beaux arts*, after Delaroche's fresco (1852); the "Virgin and Child," after Raphael (1855); the "Enshrouding of Our Saviour," after Delaroche (1855); and "Moses on the Nile," after the same (1858). He is now engaged in engraving, on large plates, the "St. Catharine" of Correggio, and the "Disciples at Emmaus" of Paul Veronese. He is also a skilful draughtsman, and his exquisite crayon portraits are much sought after by amateurs.

HENRY, the name of 10 counties in the United States. I. A S. co. of Va., bordering on N. C., and drained by Smith's river, a tributary of the Dan; area, 358 sq. m.; pop. in 1850, 8,872, of whom 3,340 were slaves. It has a hilly surface. The productions in 1850 were 232,311 bushels of Indian corn, 29,704 of wheat, and 1,013,079 lbs. of tobacco. There were 6 grist mills, 4 saw mills, 22 tobacco factories, 13 churches, and 1,391 pupils attending public schools. Value of real estate in 1856, \$1,631,907, showing an increase of 70 per cent. since 1850. Capital, Martinsville. II. A central co. of Ga., bounded N. E. by South river, a branch of the Ocmulgee, and drained by Cotton river; area, 594 sq. in.; pop. in 1852, 10,398, of whom 3,265 were slaves. The surface is diversified and well wooded, and the soil is of middling quality. The productions in 1850 were 514,796 bushels of Indian corn, 88,897 of oats, 106,905 of sweet potatoes, and 9,352 bales of cotton. There were 12 grist mills, 7 saw

mills, 1 cotton factory, 1 tannery, 40 churches, and 350 pupils attending public schools. Iron, quartz, and a small quantity of gold are found. Value of real estate in 1856, \$1,631,754. The Macon and Western railroad passes through the W. part of the county. Capital, McDonough. III. A S. E. co. of Ala., bounded S. by Florida, and separated from Georgia on the E. by the Chattahoochee river; area, 975 sq. m.; pop. in 1850, 9,019, of whom 2,242 were slaves. It has a diversified surface, and a light, sandy, but very fertile soil, drained by many small streams, and in some parts overgrown with pine forests. The productions in 1850 were 277,356 bushels of Indian corn, 93,340 of sweet potatoes, 873 hogsheads of sugar, 63,191 lbs. of rice, and 5,235 bales of cotton. There were 25 grist mills, 70 saw mills, 1 newspaper office, 26 churches, and 526 pupils attending public schools. The Chattahoochee is navigable by steamboats on the E. border of the county. Capital, Abbeville. IV. A N. W. co. of Tenn., bordering on Kentucky, bounded E. partly by Tennessee river and partly by the Big Sandy; area, 600 sq. m.; pop. in 1850, 18,233, of whom 4,821 were slaves. The surface is level and the soil rich. The productions in 1850 were 893,328 bushels of Indian corn, 141,056 of oats, 54,550 of sweet potatoes, and 2,029,132 lbs. of tobacco. There were 3 grist mills, 9 saw mills, 1 newspaper office, 70 churches, and 1,500 pupils attending public schools. Several railroads have been projected to connect Paris, the capital, with Nashville, Memphis, Hickman, Ky., and Louisville. V. A N. co. of Ky., bounded N. E. by the Kentucky river, which is here navigable by steamboats; area, 260 sq. m.; pop. in 1850, 11,442, of whom 3,013 were slaves. It has an undulating surface, partly covered with forests, and a fertile soil of limestone formation. The productions in 1850 were 964,372 bushels of Indian corn, 38,844 of wheat, 109,208 of oats, 1,057,273 lbs. of tobacco, and 39,963 of wool. There were 12 grist mills, 10 saw mills, 26 churches, and 885 pupils attending public schools. Value of real estate in 1855, \$3,309,832. The Louisville and Frankfort railroad passes through the S. W. part of the county. Capital, Newcastle. Drennon Springs, on the Kentucky river, are noted as a fashionable resort. VI. A N. W. co. of Ohio, traversed by Maumee river and drained by several of its branches; area, 410 sq. m.; pop. in 1850, 3,435. It has a level surface and a rich soil. The productions in 1850 were 76,415 bushels of Indian corn, 19,250 of wheat, 14,893 of oats, and 1,498 tons of hay. There were 1 grist mill, 8 saw mills, 1 woollen factory, 4 churches, and 1,564 pupils attending public schools. Pork is one of the chief staples. The Wabash and Erie canal, and the Toledo, Wabash, and Western railroad pass through Napoleon, the capital. VII. An E. co. of Ind., having a level or rolling surface, originally covered with dense forests; area, 385 sq. m.; pop. in 1850, 17,605. The soil is fertile and watered by several small

streams. The productions in 1850 were 940,042 bushels of Indian corn, 129,303 of wheat, 90,685 of oats, 57,336 lbs. of wool, and 7,334 tons of hay. There were 10 grist mills, 27 saw mills, 1 newspaper office, 44 churches, and 3,846 pupils attending public schools. The Indiana central and the Cincinnati and Chicago railroads pass through the county. Capital, Newcastle. VIII. A N. W. co. of Ill., bounded N. W. by Rock river, and drained also by its affluents, Green and Edwards rivers; area, 830 sq. m.; pop. in 1855, 9,218. It has an undulating surface, diversified with forests and fertile prairies, and contains good building stone and coal. The productions in 1850 were 203,820 bushels of Indian corn, 61,108 of wheat, 43,534 of oats, 10,762 lbs. of wool, and 51,285 of butter. There were 2 grist mills, 3 saw mills, and 500 pupils attending public schools. The Chicago and Rock Island and the Chicago and Burlington railroads pass through the county. Capital, Cambridge. IX. A W. co. of Mo., drained by Grand river, an affluent of the Osage; area, 750 sq. m.; pop. in 1856, 6,642, of whom 1,076 were slaves. It has a diversified surface, abounds in coal, timber, and water power, is mostly fertile, and is well adapted to stock raising. The productions in 1850 were 184,650 bushels of Indian corn, 5,684 of wheat, 53,257 of oats, 13,689 lbs. of wool, and 892 tons of hay. There were 2 grist mills, 3 saw mills, 2 churches, and 332 pupils attending public schools. The county was formerly called Rives. Capital, Clinton. X. A S. E. co. of Iowa, traversed by Shunk river, an affluent of the Mississippi; area, 432 sq. m.; pop. in 1856, 15,395. The surface is undulating and diversified by prairies and timber land. Coal and limestone are abundant, and the soil is of excellent quality. The productions in 1856 were 1,133,667 bushels of Indian corn, 174,242 of wheat, 205,835 of oats, 48,796 of potatoes, 8,511 tons of hay, and 184,864 lbs. of butter. The Burlington and Missouri river railroad passes through Mount Pleasant, the capital.

HENRY, the name of several sovereigns of England, France, and Germany.

I. ENGLAND.

HENRY I., the 3d English monarch of the Norman line, and first prince of that line born in England, son of William I. and Matilda of Flanders, born in Selby, Yorkshire, in 1068, two years after the conquest, died near Rouen, Dec. 1, 1135. His career until he became king presents few facts of importance. William I., who died when Henry was 19 years old, gave him £5,000 in silver, and predicted that he would become master of both England and Normandy. He purchased the district of Cotentin from his brother Robert, and compromised with his brother William II. his claims on his mother's lands. Robert imprisoned him, believing that he had entered into an engagement with William to effect his ruin, but released him on the intercession of the Norman nobility. When William attacked Robert, Henry sided with the

latter, showing great energy and courage, and putting the traitor Conan of Rouen to death, with circumstances of extreme cruelty. His brothers becoming reconciled on terms that neglected his interests, he went to Mont St. Michel, where they besieged him, and compelled him to give up all his possessions, on condition of being allowed to depart in safety. For some years he lived in seclusion, when the people of Domfront, one of Robert's strongest places, called him to rule over them. He made other acquisitions at Robert's expense, became reconciled with William, and went to England. On Aug. 2, 1100, he was hunting in the New forest, when William was there slain; and, riding immediately to Winchester, he claimed and obtained the crown, to the prejudice of Robert, who was then in the Holy Land, a leader in the first crusade. Three days later his coronation took place. He owed his success in part to his boldness, and in part to his liberal promises and concessions. He conciliated the clergy, inviting Anselm back to England. He promised to remedy abuses and to maintain the old Anglo-Saxon laws and usages, the charter he granted becoming the basis of all subsequent reforms. He conciliated the Saxon portion of his subjects by marrying Matilda of Scotland, daughter of Malcolm Canmore and Margaret, and niece of Edgar Atheling; but the Normans were enraged by this marriage. Robert returned from the East, and sought to recover England, which he invaded; but the brothers were reconciled, and the elder released the younger from an oath which he had taken with reference to the crown, Henry ceding all his Norman possessions to Robert, save Domfront, and giving him a pension of 3,000 marks. This was the work of Anselm, archbishop of Canterbury, who threatened Robert with excommunication. Henry violating his word respecting the safety of Robert's adherents, the latter returned to England, but was induced to depart again. Henry having obtained some triumphs over the aristocracy, the war between the brothers was renewed, and the king conquered Normandy, at Tinchebrai (1106). Robert was imprisoned, first at Falaise, and then at Cardiff, for 28 years; but his son William was humanely treated. Henry was involved in war with Louis VI., and with some of his own vassals. Peace was made with France in 1113, and tranquillity was maintained for some years. The question of investiture led to trouble with Rome, which was aggravated by the papal claim to send legates to England. In consequence of the continued troubles in Normandy, and the renewal of the war with the French king, Henry passed much of his time in France, to the discontent of the English. In 1114 he married his daughter Matilda to Henry V., emperor of Germany. The victory of Brenneville decided the war with France favorably for Henry (1118), and peace was made, so that in 1120 his power was established. The same year his son William was lost while sailing from France to England, and the king never recover-

ed from the shock. Queen Matilda had died in 1118, and Henry now married Adelicia, daughter of the count of Louvain; no children followed from this union. New difficulties on the continent caused Henry to return there in 1123; success again attended his labors, and peace was restored. The death of his nephew William, in 1128, relieved him from an active enemy. His daughter Matilda returned to England on the emperor's death, and in 1126 her father prevailed on a numerous assemblage of the clergy and laity to engage that, in the event of his death without male issue, she should be recognized as queen and duchess. In 1127 Matilda was married to Geoffrey Plantagenet, count of Anjou, and the quarrels between them caused the king much annoyance. The Welsh had given him much trouble throughout his reign, and he was about to attempt their conquest, when he died. His death was attributed to surfeit, caused by over indulgence in his favorite dish, lampreys. He was surnamed Beaulere, because of his fondness for literature.

HENRY II., founder of the Plantagenet dynasty, grandson of the preceding, and son of Geoffrey Plantagenet and the empress Matilda, born in Le Mans in March, 1133, died at the castle of Chinon, July 6, 1189. On the death of Henry I., his nephew Stephen, count of Blois, usurped the thrones of England and Normandy. A long series of contests followed, in the latter part of which Prince Henry much distinguished himself. These were terminated by an arrangement in 1153, by which it was settled that Henry should succeed to the English throne on Stephen's death, which event took place Oct. 25, 1154. Henry had become duke of Normandy in 1150, and count of Anjou and Maine in 1151; and by marrying Eleanor, duchess of Aquitaine, who had been divorced from Louis VII. of France, he obtained, in 1152, possession of nearly the whole of southern France. He was his wife's junior by 12 years. They were crowned at Westminster, Dec. 19, 1154. Henry's continental possessions comprised more than a third of France, including Normandy, Maine, Touraine, Anjou, Poitou, Guienne, and other provinces; and in a few years he made himself master of Brittany. He brought to the throne a high reputation for talent and courage, which his actions showed to be well founded. He restored the coinage, revoked improper grants, dismissed mercenaries, suppressed lawlessness, and destroyed many of those feudal castles which had been erected in Stephen's reign. But for his troubles with the church, he would have been the greatest of English monarchs, as he was one of the ablest of their number. These disputes began in 1162. Henry had resolved to curb the clergy, and made Thomas à Becket, upon whom he thought he could rely for assistance, archbishop of Canterbury, he having held the chancellorship since 1158. But Becket not only became the most austere of churchmen, after having led an easy life, but also the most vehement champion of

the independence of his order. He placed himself in direct opposition to the king; and when, in 1164, the latter began the work of reform, he found in the archbishop his most determined opponent. A cleric having been guilty of rape and murder, a dispute as to the mode of his trial took place between the king and Becket; and Henry resolved to have the question brought to a settlement, to determine the extent of the privileges of the clergy. An assembly of prelates having failed to satisfy him, he called a meeting of the nobles and chief clergy, at Clarendon, Jan. 25, 1164, in which the famous "constitutions of Clarendon" were adopted unanimously. By these it was enacted that clerks charged with crime should be tried in the civil courts; that no appeals in spiritual causes should be carried beyond the king without his consent; that if, in any lawsuit between a clergyman and a layman concerning a tenant, it was disputed whether the land were a lay or an ecclesiastical fee, this should be decided by the verdict of 12 lawful men, and if found to be a lay fee, the cause should be determined by the civil courts; that laics should not be accused in spiritual courts, except by legal and reputable witnesses; that no chief tenant of the crown should be excommunicated, nor his lands be put under an interdict, except with the king's consent; that no person, particularly no clergyman, should leave the kingdom without that consent; that the civil courts should decide all suits concerning the advowson and presentation of churches; that the churches belonging to the king's fee should not be granted in perpetuity without his consent; that the revenues of vacant sees should belong to the king, that the election to such sees should be held by the king's consent and in his chapel, and that the bishop elect should do homage to the crown; that goods forfeited to the king should not be protected in churches or churchyards; and that archbishops, bishops, and other spiritual dignitaries, should be regarded as barons of the realm, possessing the privileges and subject to the burdens belonging to that rank, and bound to attend the king in his great councils, and assist at all trials. The power of excommunication was lessened, the clerical privileges respecting the collection of debts were annulled, and the sons of villeins forbidden to be ordained clerks without the consent of their lords. Becket at first refused his assent to these measures, but at last he swore to their observance. He broke his faith with the king when the pope annulled the constitutions. The quarrel lasted for 7 years, when Becket was killed by 4 Norman barons. During the quarrel, Becket was banished, the king of France began hostilities with England, and the war lasted 3 years. The death of Becket annoyed Henry, as he feared the pope would carry out his threat of excommunication; but his negotiators succeeded in confining the papal anathemas to those who had committed the crime. In 1171 Henry undertook the conquest of Ireland, which country had been given to him by a papal bull in

1156, and in which a few of his subjects had for some years been waging successful war. He met with little resistance. He was now reconciled to the church, and Rome confirmed the grant of Ireland previously made, he having taken the most solemn of oaths that he was not guilty of Becket's murder. The troubles in his family, which clouded the latter portion of his life, now commenced. He had associated with him his eldest son, Henry, in the government of England, Normandy, Anjou, and other countries; Richard was made ruler of Guienne and Poitou; Geoffrey was to be duke of Brittany; and John was to receive Ireland. But from 1173 these sons gave him much vexation, being encouraged to rebel by their mother, who was enraged by Henry's conjugal infidelities, by the French king, who was the father-in-law of the eldest, and by the nobles in various parts of his dominions. Henry now did penance at the tomb of Becket, fasting and praying there, and submitting to flagellation at the hands of the monks. The Scots, having invaded England, were defeated, and the rebels, including his sons, returned to obedience. The king of Scotland did homage to him, and surrendered portions of his dominion. In the interval of quiet that followed, Henry made several legal reforms. The disputes that broke out in his family were fatal to his peace. His sons quarrelled with him, and with each other. The eldest died in 1183, and Geoffrey was killed in 1186. In 1188 Richard rebelled, and was aided by France, though both Henry and the French king had taken the cross, intending to embark for Palestine. Henry was beaten, and submitted to the terms dictated by his enemies; but died of a fever, brought on by mental irritation.

HENRY III., son of John, king of England, and of Isabella of Angoulême, born Oct. 1, 1206, died at Westminster, Nov. 16, 1272. He became king Oct. 17, 1216, being then but 9 years old. The desperate state to which England had been reduced by the misgovernment of John makes the period of the accession of Henry III. the darkest one in English history; but, owing to the talents and wisdom of the earl of Pembroke, who was protector, the state of the country was rapidly improved. He confirmed Magna Charta, conciliated the discontented barons, defeated the French both by sea and land, and restored peace. Pembroke soon dying, power passed to the hands of the bishop of Winchester and Hubert de Burgh, the latter being justiciary, and having most weight in the government. They had not the influence of Pembroke, and could not control the barons. War was made with France, but it was found impossible to recover the French provinces lost by John. In 1231 the justiciary, who had received large gifts, and been made earl of Kent, was overthrown, and Winchester, an able but unprincipled man, monopolized power. He was a Poitevin, and many of his countrymen going over to England, they were intrusted with office, to the discontent of the English of all ranks, whom they op-

pressed and plundered. This evil was aggravated by the marriage of the king in 1236 with Eleanor of Provence, many of whose countrymen came to England, and shared in the king's bounty. An expedition into France, in 1242, terminated disastrously. The pope offering Henry the crown of Sicily for his son Edmund, the king was involved in debt by his endeavors to support the claim. The chief interest of his reign belongs to the disputes between the king and the barons. These came to a head in 1258, when Simon de Montfort, earl of Leicester, was chief of the baronial party, and held possession of the king's person. The "provisions of Oxford," enacted by the parliament which met there in 1258, provided for the election of knights of the shire, 4 from each, for 3 sessions of parliament in each year, and for the annual election of sheriffs. Measures hostile to the foreigners were also adopted. Government was now in the hands of the barons, who lost the popularity they once had enjoyed. Louis IX. of France made a treaty with Henry in 1259, on terms favorable to the latter. Circumstances enabling the king to renew the contest with the barons, war ensued, and the royalists were defeated at Lewes, May 13, 1264, Henry being taken prisoner. Prince Edward was compelled to make the treaty of Lewes with De Montfort, and himself to become a hostage. On Jan. 20, 1265, a new parliament assembled in London, called by De Montfort, to which were summoned two knights from each county, and two deputies from each of certain cities and boroughs, such deputies never having previously been summoned; and the writs were addressed, not to the sheriffs, but to the boroughs. This was the commencement of the house of commons. Prince Edward having escaped from Leicester, the royal party renewed the war, and Leicester was defeated and slain at Evesham, Aug. 4, 1265. The king's authority was reestablished, and tranquillity restored. Henry's reign lasted 56 years, the longest in English history except that of George III.

HENRY IV., founder of the royalty of the house of Lancaster, supposed to have been born in Bolingbroke, Lincolnshire, April 4, 1366, died in Westminster, March 20, 1413. He was the eldest son of John of Gaunt, duke of Lancaster, 4th son of Edward III., and of Blanche, daughter and heiress of Henry Plantagenet, duke of Lancaster, great-grandson of Henry III. His first title was earl of Derby. At the age of 15 he married Mary Bohun, daughter of the earl of Hereford, who was descended from Edward I. In his youth Henry delighted in tournaments and adventures. In 1390 he went to the assistance of the Teutonic knights, serving in Prussia and Lithuania. He then went to Barbary. Returning to England for a season, he set out on a journey to Palestine in July, 1392. He travelled by the way of Dantzic, Königsberg, Vienna, Friuli, and Venice, sailing from the last named place for Rhodes, whence he returned to England in June, 1393, visiting

Venice, Milan, Piedmont, Savoy, and France. Richard II. made him duke of Hereford in 1397. In 1398 he brought an accusation of traitorous designs against the duke of Norfolk, who denied it, and appealed to the trial by battle. The arrangements for fighting were all completed, when the king put an end to the contest, banishing both parties, Norfolk for life, and Hereford for 10 years. Subsequently Hereford's term of exile was reduced to 6 years; but when, on his father's death, he became duke of Lancaster, Richard banished him for life, and seized his immense possessions. Lancaster resolved to return home, ostensibly to assert his claim to his property, but with the intention of obtaining the crown. This course was advised by his friends. He landed at Ravenspur, July 4, 1399, with a small force, the king being absent on an expedition in Ireland. Lancaster declared that his only object was to establish his right to his hereditary possessions; but he became immediately the chief of all the opposition that had been created by Richard's follies and crimes, and was joined by persons of all classes, from the Percys to the humblest commoners. Success followed all his movements; and when Richard returned he was unable to make any resistance, and became Lancaster's prisoner, resigning the crown, which parliament conferred upon the duke, who thus became Henry IV. The only person who objected was the bishop of Carlisle. The new king affected to trace his right to the crown to his descent from Edmund of Lancaster, who was reported to have been the elder brother of Edward I., but to have lost his inheritance from some personal deformity. This claim was not valid, and Henry had only such right as came from conquest and parliamentary election. This defect in his title led him to court the clergy, who were now troubled by the Lollards; and though his father had been the greatest patron and supporter of Wycliffe, Henry became the persecutor of the reformers. The statute *de hæretico comburendo* (for the burning of heretics) was adopted in 1401, and it was not allowed to remain a dead letter. Henry's reign was mostly passed amid conspiracies and civil and foreign war, and he spared few of his enemies. He found the Welsh his constant foes, and was more than once attacked by the Scots. The Percy broke with him in 1403, though they had been the chief instruments in his elevation; and the battle of Shrewsbury was fought July 21, 1403, and Henry Percy, called Hotspur, defeated and slain. Other attempts were made to depose him, but, though not without great difficulty, the king triumphed over his enemies, Glendower in Wales alone proving unconquerable, though much reduced. An English vessel took the ship on board of which Prince James, heir apparent of the Scotch crown, was proceeding to France, and the prince remained a captive for many years. The feeling between France and England during this reign was one of extreme bitterness, the cause

of Richard, who had espoused for his second wife a daughter of the French king, being popular in the former country; but it did not go to the length of war, which Henry was not in condition to wage. He became unpopular shortly after his elevation to the throne, though as a subject he had been the favorite of all classes, as his father had been everywhere in England but London, and in those places which were immediately under the influence of the church. He never recovered his popularity, and something of the odium in which he was held by his subjects descended to history, of which he is not a favorite character. His first wife died in 1393, leaving 4 sons, who were among the most eminent men of that age, and 2 daughters. His second wife was Joanna of Navarre, widow of the duke of Brittany, whom he married in 1402, but without issue.

HENRY V., son of the preceding, and second king of the Lancaster branch of the Plantagenets, born, it is supposed, in Monmouth, Aug. 9, 1388, died in Vincennes, Aug. 31, 1422. But little is known of his childhood. On his father's banishment, Henry was seized by Richard II., who took him with the expedition to Ireland, and knighted him. When Richard returned to England, to meet the youth's father, he placed him in the castle of Trim. His father caused him to be liberated, and brought to London; and he was created prince of Wales, Oct. 15, 1399. He took part in the proceedings against the insurgent Welsh in 1401, before he had completed his 15th year, and gave indications of his future eminence, Percy, commonly called Hotspur, bearing evidence to his military talent and his personal goodness. He was then appointed to the command of the royal forces in Wales, and was made lieutenant of Wales in 1403. He had a prominent part in the battle of Shrewsbury. On March 11, 1405, he defeated the rebels at Grosmont. The constant rebellion that prevailed in England prevented the king from sending much assistance to his son, and he was thrown upon his own resources, which tended to the development of his character and prowess; and the speaker of the house of commons, in 1406, bore testimony to his good qualities as a son and as a man. He held a large place in the estimation of the country, and there is ground for supposing that his father was jealous of him. At the close of 1407 he commanded an expedition that was sent into Scotland, and after some successes made a truce with the Scotch. The house of commons thanked him for his conduct, at the instance of his father. His immediate connection with Wales is believed to have ceased in 1409. He was made warden of the cinque ports and constable of Dover the same year, and captain of Calais in 1410. The king gave him his house of Coldharbor, in London, which accounts for the prince's connection with the city. Councils were there held, at which the prince presided, as he did when they were held at other places. The stories respecting his irregularities, loose life, and association with high-

waymen, rest upon very insufficient evidence, though Lord Campbell argues warmly in support of the long received tale that he was committed to prison by Chief Justice Gascoigne for contempt and disobedience, which was not published until 4 generations after the date of its supposed occurrence. There is no proof, either, that he was guilty of peculation, or that he sought to dethrone his father. So far as there is evidence of his character and conduct, the prince would seem to have been in theory and action above the average morality of his time. The popular idea of him is taken from Shakespeare, whose "Prince Hal" is not the historical Henry of Monmouth, but almost as ideal a character as Hamlet himself. Henry IV. dying March 20, 1413, Henry V. was proclaimed the next day. His accession caused great rejoicings, which could not have been the case had he been the notoriously vicious person he has been drawn, as no time had been allowed him for reformation. Parliament voluntarily tendered the oath of fealty and allegiance, an act without precedent. He behaved with magnanimity toward the enemies and rivals of his house, particularly in the instance of the earl of March, who was the legitimate heir to the crown. His legislation is not open to the same praise. He continued the original error of the house of Lancaster, by persecuting the Lollards. He was attached to Catholicism both from conviction and from supposed interest; and he sent representatives to the council of Constance to help to reform the church. He determined to renew the claim of the English sovereigns to the crown of France, though it was far less strong in his person than it was in that of Edward III.; and his determination is attributed to the advice of the clergy, who wished to draw off the attention of the people from church questions, and to save the church's patrimony, the seizure of which had been called for by the house of commons. He first claimed the entire kingdom of France when negotiating an alliance for a marriage with Catharine, daughter of Charles VI.; and when that claim was scouted, the English envoys, waiving it without prejudice to their principal's rights, "demanded the sovereignty of the duchies of Normandy and Touraine, the earldom of Anjou, the duchy of Brittany, the earldom of Flanders, with all other parts of the duchy of Aquitaine, the territories which had been ceded to Edward III. by the treaty of Bretigny, and the land between the Somme and Gravelines; to be held by Henry and his heirs, without any claim of superiority on the part of Charles or his successors. To these demands were added the cession of the county of Provence, and payment of the arrears of the ransom of King John, amounting to 1,600,000 crowns. It was also intimated that the marriage with Catharine could not take place unless a firm peace were also established with France, and that 2,000,000 crowns would be expected as her dower." These monstrous terms were rejected

by the French, who, however, offered to make great concessions, in the vain hope of avoiding war. The English parliament strongly supported the king, and the guilt of one of the most unjust wars ever waged lies rather upon the nation than upon its sovereign. Parliament commenced the system of loans for the support of this war. French ambassadors were sent to England to labor for peace, but without success. A powerful force was assembled at Southampton; and a conspiracy was there detected, which was the first act in the contest between the houses of York and Lancaster. The earl of Cambridge, a grandson of Edward III., and the husband of the sister of the earl of March, was at the head of the plot, which had for its object the restoration of the crown to the legitimate line of Clarence. Cambridge and others suffered for their conduct. The expedition sailed from Southampton, Aug. 11, 1415, and reached France in two days. Harfleur was taken, Sept. 22, after a siege of 5 weeks. Henry challenged the dauphin to a personal conflict, to decide in that way the issue of the war, but his proposition was not accepted. Resolving to return to England by the way of Calais, Henry left Harfleur with a small army, his forces having suffered from sickness, and on Oct. 25 encountered a great French army at Agincourt, which he totally defeated. In a moment of panic, he caused his prisoners to be massacred, which has left a lasting blot on his name. He returned to England, Nov. 17. The English rejoiced much over the victory, but they found the war very burdensome, and it was not vigorously prosecuted. Sigismund, emperor of Germany, sought to mediate between the combatants, and visited both France and England; but failing, he joined the latter. Little was done in 1416. In 1417 Henry invaded France again, and met with considerable success. The French vainly sought peace. The Scots invaded England, and were beaten. Lord Cobham was captured in Wales, and executed as a traitor and a heretic. Rouen was besieged, and, after a long and terrible defence, was taken, Jan. 19, 1419. The duke of Brittany, following the example of the duke of Burgundy, joined Henry. An interview between the French and English authorities having produced no effect, the war was renewed, victory remaining with Henry. The murder of the duke of Burgundy by partisans of the dauphin caused the French king to denounce his own son, and to resolve that Henry should be made regent of France. At the end of Nov. 1419, an arrangement was made that Charles VI. should remain king while he lived, but that, because of his insanity, Henry should become regent, and, marrying the princess Catharine, should succeed him on his death. An armistice was concluded, from which the dauphin and his party were excluded. The two kingdoms were to be united, and a treaty was made at Troyes, May 21, 1420. The same day Henry and Catharine were affianced, and their marriage took place May 30. A large part of France contin-

ned faithful to the dauphin, and he was aided by the Scots, but the successes of the English continued. Henry returned to England, where Catharine was crowned, Feb. 23, 1421. He made a journey to the north, during which he received news of the battle of Beaugé, in which the French and Scots defeated and killed his brother Clarence. Making his brother Bedford regent, he returned to France, July 12, where his usual good fortune in war awaited him; but nothing could overcome the stubborn resistance of the loyal portion of the French nation, though they might have been entirely conquered, perhaps, had Henry lived; but he was seized with a fatal illness, the exact nature of which is unknown. At the time of his death he had formed a plan to embark on a crusade, the Mohammedans being then a source of terror to Europe.—“*Memorials of Henry the Fifth, King of England*,” edited by Charles Augustus Cole, of the public record office, were published in London in 1858 by the authority of the lords commissioners of her Britannic majesty’s treasury, under the direction of the master of the rolls.

HENRY VI., son of the preceding and of Catharine of France, and last monarch of the Lancastrian dynasty, born in Windsor, Dec. 6, 1421, believed to have been killed in the tower in May, 1471. He was the most unfortunate of English sovereigns, and in nothing more so than in being left fatherless at the age of 9 months. Henry V. on his death-bed had appointed his elder brother, the duke of Bedford, regent of France, and his younger brother, the duke of Gloucester, regent of England; but parliament, which under the Lancastrian dynasty—its own creation—had risen to much importance, disregarded his wishes. Bedford was made protector and defender of England, and when he should be absent his office was to be held by Gloucester. Cardinal Beaufort had charge of the king’s person and education. In Oct. 1422, Charles VI. died, and Henry was proclaimed king of France. A long struggle ensued between his supporters and those of Charles VII., in which the latter finally triumphed, and in 1451 the English had lost all their possessions in France, with the exception of Calais. Henry was crowned at London in 1429, and at Paris in 1430, the protectorate then ending. During his minority there had been much contention between Cardinal Beaufort and the duke of Gloucester, and the king’s coronation was a triumph of the former, who then became supreme, and gave to the government a strong ecclesiastical tendency, which was offensive both to the people and to the aristocracy. As Henry grew up, it was found that he had inherited none of the martial qualities of his father, but that he resembled his maternal grandfather, Charles VI. When his marriage was resolved upon, the Beaufort party triumphed in securing for him (1444) the hand of Margaret of Anjou, daughter of René of Provence, titular king of Jerusalem, Naples, &c. The Beaufort party, too, was successful in making an arrange-

ment with France, that of Gloucester upholding the high pretensions of Edward III. and Henry V. The earl of Suffolk negotiated the marriage and the peace, and, after the death of Beaufort and Gloucester in 1447, became the principal person in the kingdom, was first created marquis and then duke, and held high offices and received valuable gifts. He became very unpopular, and was banished in 1450, and murdered. Jack Cade's insurrection occurred in 1450, and its temporary success, from its leader assuming the name of Mortimer, showed the popularity of the legitimate line, and the unpopularity of the house of Lancaster. Philippa, daughter of Lionel, duke of Clarence, 3d son of Edward III., had married Edmund Mortimer, and their granddaughter Anne—daughter of Roger, earl of March—became the wife of Richard, earl of Cambridge, second son of Edmund, duke of York, 5th son of Edward III. Cambridge was beheaded for treason in 1415. His son Richard was now duke of York, and representative of the right of Clarence, while Henry VI. was descended from John, duke of Lancaster, 4th son of Edward III. Had Henry been an able monarch, the house of Lancaster could not have been disturbed; but his weakness, and the general unpopularity of the government, encouraged York to put forward his claims. He was much loved because of his bravery, mildness, and good conduct both in public and private life; and his immense possessions gave him vast influence. His wife was a Neville, and he had the support of the ablest members of that family, the earls of Salisbury and Warwick, father and son. So long as no offspring followed from the marriage of Henry and Margaret, it was believed that York would peaceably succeed to the throne on the king's death, though it is probable there would have been a contest between the two aristocratical factions into which the kingdom was divided, the great nobility having lost their possessions in France, and being thrown back entirely upon England, which was itself burdened with debt. But in 1453 Margaret gave birth to a son, whose legitimacy was doubted; and at the same date the king became imbecile. The Yorkists seized the government, overthrowing Somerset, who had succeeded to Suffolk; and the duke was made protector by parliament. On recovering his health, Henry restored Somerset to office, whereupon York levied an army, and demanded reform in the government. The first battle of St. Albans was fought May 23, 1455, and the Yorkists, or party of the white rose, were victorious. The administration passed into York's hands, and he was king in fact, but Henry's authority was restored in 1456. A partisan quarrel in 1459 renewed the war; and in 1460 the Lancastrians were defeated by Warwick and the king captured at Northampton. York now demanded the throne, and parliament decided that he should succeed to it on Henry's death, and the duke in the mean time administer the government. The queen raised an army in opposition to this arrange-

ment, with which she won the victory of Wakefield, Dec. 23, 1460, in which York was slain. The second battle of St. Albans, Feb. 19, 1461, restored Henry to the hands of his friends; but the victory of Towton, won by Edward, duke of York, now Edward IV. in fact, March 29, 1461, compelled him to fly, with his wife and son, to Scotland. Margaret, having foreign assistance, renewed the war in 1463, but was defeated in 1464, and Henry was captured in 1466. He was imprisoned in the tower until 1470, when Warwick restored him to the throne after his quarrel with Edward IV. On the return of Edward, Henry again became prisoner, and was either killed, or died naturally, about May 21, 1471. According to one authority, he died of grief or vexation. Another account is that he was put to death by order of the king's council to take away all title from future insurrection. There is not a shadow of evidence that he was killed by Richard of Gloucester. Henry's misfortunes were principally owing to the loss of his French possessions, which offended the pride of his subjects; but that loss was a blessing to England, for if it had not happened the government would have been transferred to France, and England would have been degraded to the condition of a province.

HENRY VII., founder of the Tudor dynasty of English kings, born at Pembroke castle, in South Wales, July 26, 1456, died at Richmond, April 21, 1509. On the death of Henry V., his widow, Catharine of France, married Owen ap Tudor, a Welsh gentleman, of ancient lineage, but of moderate fortune. Of the 4 children born of this marriage, the eldest was Edmund Tudor, who was created earl of Richmond by Henry VI., his half brother; and Richmond in 1455 married Margaret Beaufort. John of Gaunt, duke of Lancaster, 4th son of Edward III., had married for his third wife Catharine Swynford, who had long been his mistress. None of their offspring were born in wedlock, but he obtained the legitimation of them all by a papal bull, a charter from Richard II., and an act of parliament. John Beaufort, duke of Somerset, grandson of John of Gaunt and Catharine Swynford, married Margaret, widow of Sir Oliver St. John, *née* Beauchamp, and their only child was Margaret Beaufort, who became countess of Richmond in 1455, and countess dowager Nov. 1, 1456, 3 months after the birth of her son. For some years after his birth, Henry of Richmond resided at Pembroke castle, where he continued even after that place had been given to the Herberts, the chief of whom had charge of him. He was attainted soon after the crown passed to the house of York. His education was conducted by his mother, a woman of piety and learning; and under her training he grew up a thoughtful and serious boy, much inclined to religion. The Herberts treated him well, and a union between him and the favorite daughter of their head was contemplated. When the house of Lancaster was restored in 1470, Richmond was taken from Wales, and placed in

Eton college, where he was seen by Henry VI., who predicted that he would be king. The next year saw the return of Edward IV., and the death of Henry VI. and his only son, when Richmond became chief of the Lancastrian party. By letters patent from Richard II. in 1397, granted to the duke of Lancaster, the Beauforts were to be "admitted to all honors and dignities," which placed them in the line of succession to the crown; but when Henry IV. ratified the act of Richard II., he added, after the words "all honors and dignities," these other words, "except to the royal dignity." Thus the Beauforts were not from the first excluded from claims to the throne, and Henry of Richmond had plausible ground for asserting that he was the lineal heir of John of Gaunt, and head of the house of Lancaster. Henry was sent to Pembroke castle after the triumph of the Yorkists, and going to Tenby, sailed thence to France. Landing in Brittany, he was seized by the duke of that country, who held him a prisoner many years, though he refused to surrender him to Edward IV., who sought to obtain possession of his person in various ways. At length, in 1484, when the usurpation of Richard III. had caused much discontent in England, Henry was recognized as chief of all parties opposed to the government, and a marriage was arranged between him and Elizabeth, eldest daughter of Edward IV. The duke of Brittany finally liberated him, and with a small force he sailed for England. He was unsuccessful, and his fleet dispersed, and his party in England was crushed for the time by Richard. After a variety of romantic adventures, he raised a larger force, sailed from Harfleur, Aug. 7, 1485, and soon after landed at Milford Haven. The victory of Bosworth, Aug. 22, and the death of Richard III., placed the crown on his head. He was crowned at Westminster, Oct. 30. Parliament settled the throne on him and his heirs. He married the princess Elizabeth, Jan. 18, 1486, but her coronation did not take place until the close of 1487. Henry's reign was much disturbed by pretenders and plots. The first pretender was Lambert Simnel, the son of a mechanic or laborer, who claimed to be the earl of Warwick, son of that duke of Clarence who had been put to death by his brother Edward IV., and grandson of that Warwick who had borne so conspicuous a part in the wars of the roses. The true earl was a prisoner, and the pretender was exposed; but an army was raised, which was able, at Stoke (June 16, 1487), to dispute the day with the royal forces, and to place the Tudor cause in great peril. Victory at length declared for Henry, and the Yorkists lost all their leaders on the field. The king, with good-natured contempt, made Simnel a turnspit. A more formidable competitor was that person who is known in history as Perkin Warbeck, who claimed to be Richard, duke of York, 2d son of Edward IV., and whose claim, admitted by several monarchs, and by a large portion of the English people and aristocracy, has found strong defenders

among historical writers. The assistance he received from Burgundy, France, Scotland, and Ireland alarmed Henry. He detected a conspiracy that was formed by some of the nobility, and put the leaders to death, including Sir William Stanley, to whom he owed the victory of Bosworth and the throne. Had the pretender been in condition to push his claim at an early period, he might have succeeded; but he came too late, and when he appeared with the Scotch army, his cause was lost. A Cornish rebellion, caused by taxation, was put down at Blackheath, June 22, 1496. To revive this rebellion, Perkin went to Cornwall, but failing, he became a fugitive, and fell into the king's hands. Henry had him set in the stocks, and forced him to admit that he was an impostor, he reading the confession which he had written with his own hand to the people assembled in Cheapside. He was then confined in the tower. Making there the acquaintance of Warwick, he persuaded him to accompany him in an attempt at escape. They were retaken, and Perkin was hanged at Tyburn in 1499. Warwick, who had been the object of a third plot, was beheaded, a deed as foul as any that has been attributed to Richard III. Henry's motive was, as he said, to satisfy Ferdinand of Aragon, who would not give his daughter Catharine to the prince of Wales while any Yorkist prince remained on earth. The son in behalf of whom this act was committed died in 1502. Henry became very avaricious in his last years, and by the revival of old laws, and other means of an oppressive character, was enabled to amass the sum of £1,800,000, according to some accounts, which are probably not to be trusted, as the amount would be equal to \$130,000,000 of our money. He extorted money from his subjects under pretence of making war on France, which they demanded, but which he, "an exceedingly wise and politic prince," knew better than to undertake. He sold pardons, and drove a trade in offices of the court and the church. The two most noted of the instruments of his avarice were Empson and Dudley. In the 11th year of his reign the statute for the security of the subject under a king *de facto* was passed. Seven years earlier was passed the statute of fines, which was but a copy of that of Richard III., and probably reenacted only to give validity to that monarch's laws; so that Henry's act, which has been often mentioned as evidence of his depth of thought and subtlety of intention, was but an ordinary proceeding. In fact, Henry did but carry out the policy at which both Edward IV. and Richard III. had aimed. The statute protecting those who should adhere to a king *de facto* was made necessary by the slaughter that had occurred, judicially, among the aristocracy, while the contest between the houses of York and Lancaster distracted England, and which was essentially a contest between two factions of the nobility. The clergy were not friendly to Henry, and in each case of a pretender a priest was concerned.

Yet he followed the policy of the house of Lancaster, causing at least two Lollards to be burned, and severely persecuting many others. He sought the reform of the church, and we find in his reign the first indications of that course which ended, in his successor's time, in the English reformation. Henry encouraged commerce, and patronized voyages of discovery. His foreign policy was judicious; and by marrying his eldest daughter to James IV. of Scotland, he furthered that which all the vigor and victories of the Plantagenets had not advanced in the least, but prevented—the ultimate union of the two kingdoms. Worn out with anxiety and care, he died at the age of 53, his mother, who had better claims to the crown than himself, surviving him some months.

HENRY VIII., 2d king of England of the Tudor dynasty, and 2d son of the preceding king and Elizabeth of York, born at Greenwich palace, June 28, 1491, ascended the throne April 22, 1509, died Jan. 28, 1547. His father intended that he should become the head of the English church, and was educating him for the office of archbishop of Canterbury, when the death of his elder brother, Arthur, made him heir apparent, April 2, 1502. Arthur had married Catharine of Aragon, daughter of Ferdinand and Isabella, receiving with her 200,000 crowns, one half of which was paid down; and on his death her parents desired that she might be sent home, and the money refunded. Henry VII. objected, and proposed that Catharine should marry the new prince of Wales, who was 5 years her junior; and she was betrothed to him, June 25, 1503. Two years later the prince read and signed a protest against this contract, in presence of his father's counsellors, declaring that he did not mean to fulfil it. This was the work of his father, who wished to marry Juana, widow of Philip I. of Castile, and elder sister of Catharine. Henry VII. probably altered the date of the protest at a later period, so as to disguise the object of it. The prince of Wales was at that time attached to Catharine, and a dispensation had been granted by the pope as early as 1504, allowing the parties to marry, on the ground that the marriage with Prince Arthur had not been consummated. The king, who was always conscientious when ill, appears at times to have had some scruples on the subject of the marriage, and would have restored the Castilian princess to her parents, but that he could not part with her portion. He died, and in less than two months Henry VIII. and Catharine were married. This hasty marriage was made, in the first instance, at the king's desire, but it was probably urged on by most of the statesmen around him because of their anxiety to establish the succession. The wars of the roses in the preceding century had made an indelible impression on the English mind, the effect of which was visible throughout the entire history of England during the existence of the house of Tudor, and to which must be at-

tributed much of the vicious conduct of which they were guilty. Should Henry VIII. die without an heir, there would ensue an immediate contest for the crown between the houses of York and Tudor, both represented by women—the former by the countess of Salisbury, a daughter of the last duke of Clarence, brother of Edward IV., and the latter by the daughters of Henry VII. Archbishop Warham opposed the marriage, on the ground of the too near relationship of the parties. Bishop Fox argued in its favor, though it was under his direction that the king, when prince of Wales, had protested against it. The privy council recommended the marriage, from motives, however, which had nothing to do with the question of relationship. The marriage was solemnized at Greenwich, June 7, and they were crowned, June 24. Few monarchs have been more popular than was Henry at his accession. He was the heir of both branches of the old royal house, his father representing that of Lancaster, and his mother that of York. His person was eminently handsome, his mind had been highly cultivated, and he was fond of martial pleasures. He gave up Empson and Dudley, the obnoxious ministers of the late king, to vengeance, together with their instruments. He returned fines that had been unjustly or oppressively exacted. Much was hoped and expected of him, and not altogether in vain. Though addicted to pleasure, he was not unmindful of business, and paid special attention to foreign affairs. His manners were pleasing, yet he evinced at an early period not a little of that obstinacy which became the chief trait of his character in later life. He is often spoken of as a lavish prince, but Wolsey said that he was the most avaricious man in the world. Had he died within 20 years from the date of his accession, he would have been the most popular monarch in English history. His foreign connections began early. In 1510 he received the golden rose from Pope Julius II., who wished to obtain his aid to expel the French from Italy; but at first he was disposed to be moderate, and to pursue substantially the policy of his father. He made a treaty with France, and then entered into engagements with his father-in-law, guarantying his Spanish dominions against the French, and sent an ambassador to Rome to promote a pacification. Gradually, however, he was drawn into the war on the side of the pope and Ferdinand, and English forces were sent to their assistance. In 1512 was formed a league against France by the pope, the emperor, Aragon, and Venice. Henry led a large army into France in 1513, after his fleet had experienced a check, and the French had threatened the English coast. Maximilian I., emperor of Germany, served under him as a volunteer. Great things were expected from this invasion by those who recollected what had been accomplished by the English in France in the two preceding centuries. "The pope and all other great men here," Henry's ambassador wrote

him from Rome, "now look daily to hear that your grace shall utterly exterminate the French king." These expectations were not realized. The French were beaten at the battle of spurs, which was an unimportant skirmish, remarkable only because Bayard was then captured; and the English took Théroutanne and Tournay. Henry then returned home with most of his forces. Louis XII., hoping to intimidate Henry, had called the duke of Suffolk, one of the nephews of Edward IV., to France, whereupon Henry caused his brother to be put to death, after he had long been detained a prisoner. While the king was in France, James IV. of Scotland led a great army into England, which was totally defeated at Flodden by the earl of Surrey, Sept. 9, 1513, and the Scottish king slain. Being deserted by his allies, Henry made peace with Louis XII., who married his sister, Mary Tudor; but the French king soon dying, Mary married Charles Brandon, duke of Suffolk. Wolsey, whose career had commenced in the preceding reign, was now high in favor with the king, and his course on many occasions gave much offence to the nobility. Henry heaped honors upon him; he held the archbishopric of York, and the bishoprics of Durham and Winchester, and other offices, living in great state, and really governing the kingdom. He was made cardinal in 1515, and aspired to the papacy. The successes of Francis I. in Italy alarmed Europe, and the German emperor sought to engage Henry to act against France by holding out to him hopes of being made his successor; and Francis, in retaliation, formed plans for an invasion of England in support of Suffolk's claim to the throne. This pretender was an object of terror to the English government until he was slain at the battle of Pavia. The successes of the Turks continuing to alarm the western nations, Henry listened to the pope's plans for a crusade. On the death of Maximilian I. Henry thought of becoming a competitor for the imperial crown, but soon discovered that he had no chance of success. The election of Charles of Spain to the imperial throne caused Henry and Francis to become friendly, and in 1520 a meeting was arranged between them. Before it could be held, Charles V. visited England, and there gained the influence of Wolsey, by affecting to favor his aspirations to the papedom. Francis and Henry then met, in a place agreed upon between Guines and Ardres, on territory belonging to the latter, though in France. The meeting was so magnificent that the place of it was known as the field of the cloth of gold. Henry visited the emperor at Gravelines, where Charles completed his conquest of Wolsey by conferring Castilian sees upon him. War breaking out between Charles and Francis, Henry was induced by Wolsey to favor the former, and to enter into an offensive alliance with him. Henry received from Leo X., in 1521, the title of defender of the faith, in consequence of having written a book against Luther and his doctrines. The same year oc-

curred the execution of the duke of Buckingham, one of the greatest nobles of the realm, and descended in the female line from Edward III. His death was attributed to Wolsey, but it was due to the jealous rage of Henry, who could not bear about him any one who had, or could pretend to have, claims to the succession in the event of his dying without issue. The death of Leo X. and the elevation of Adrian VI. endangered the alliance between Charles V. and Henry, because of Wolsey's disappointment; but the emperor visited England, where he so exerted his influence as to soothe the cardinal, and to prevail upon the king to declare war against France. An English army, commanded by Surrey, invaded France, but did nothing beyond the burning and pillaging of a few places of little note. Francis I. again called forth the pretender Suffolk, and threatened England with invasion; and these threats, and the alarm they caused, show that the party of York was still formidable in that country, a fact that palliates many of the king's acts. Henry was a party to the conspiracy of the constable Bourbon against Francis in 1523; and from this conspiracy he expected to become as powerful in France as Henry V. had been. The failure of the plot, however, ruined Bourbon, while an English army, commanded by Brandon, duke of Suffolk, performed as little in France as had been done by that of Surrey. The death of Adrian VI., in 1523, excited anew the hopes of Wolsey, but Charles V. threw his influence into the scale of Cardinal de' Medici, who became Clement VII. This disappointment caused a change in Wolsey's mind, and he determined to withdraw his master from the imperial alliance; but it was not until after the battle of Pavia that he was able to accomplish his purpose. Henry, indeed, was at first disposed to prosecute the war more vigorously than ever against France, and Bourbon showed that he could obtain the crown of that country; but Wolsey's policy prevailed, much aided by the emperor's conduct, as he evinced a disposition hostile to English aggrandizement. A treaty of peace was made with France, in Sept. 1525, on terms advantageous to England. In 1527 Henry and Francis formed an alliance for the expulsion of the imperialists from Italy, and the deliverance of the pope, who was the emperor's prisoner. Henry renounced all claims to the French throne, and Francis agreed to pay 50,000 crowns annually to Henry and his successors. Wolsey made a magnificent journey to France, which the public associated with the thought of Henry's divorce, with a view to his marriage with a French princess; and it is from this time, the spring of 1527, that the question of divorce becomes the leading incident of Henry's reign. The marriage of Henry and Catharine had not been productive of heirs. During the first 9 years of their union, the queen had thrice miscarried, two sons died immediately after birth, and a third son was still-born. The only child that lived was the princess Mary, born in

1516. Henry, who was superstitious even to fanaticism, was much impressed by these repeated misfortunes, and believed they were punishments for having married his brother's wife. Mr. Froude thinks that the idea of a divorce had been maturing in his mind for years, when accident gave it sudden prominence. The marriage of the princess Mary with a French prince being spoken of as probable, the legitimacy of the princess was questioned by the French envoy, the bishop of Tarbes. This the king asserted in council, though it has been doubted whether the bishop ever raised any such question. At this time the pope was suffering from the attack of the imperialists, and soon became a prisoner of the emperor; and Wolsey, who was capable of forming a comprehensive scheme, determined to take advantage of these circumstances, and to procure a divorce, in the hope of being able to commit Henry thoroughly to the cause of the ancient church, which was beginning to feel the attacks of the reformers. Had the pope readily granted Henry a divorce, he would have been the most determined foe that the reformation ever encountered. But apart from the theological reasons which deterred the pope from this step, he had to dread the resentment of the emperor, who was Catharine's nephew. Wolsey aimed at a reformation of manners in England, and he hated the emperor because of his repeated disappointments respecting the papacy; and in both the ends he proposed to effect, the moral reformation and the divorce, he had a good right to count upon the pope's assistance, as matters stood in 1527. But it was impossible that the pope should continue to be the open enemy of the emperor; and unless he should so continue, his aid in the divorce question could not be counted upon. The alliance with the emperor, too, was popular in England, he being ruler of Flanders, with which country England had a great and profitable commerce. The emperor, too, at that time, was popular in England; with the reformers, because he was at war with the pope; with the conservatives, because they knew his position necessarily made him the champion of the old order of things, though circumstances had for the time made him their apparent enemy; and generally, because he was the foe of France, England's old rival. Wolsey, however, triumphed over all these obstacles, by convincing Henry that by a change of foreign policy he could cause the pope to grant the divorce he so much desired; and in his correspondence with the English agent at Rome, he declared that the king would disregard the wishes of his subjects, and the private interests of his realm, to attach himself cordially and constantly to the holy see, provided the pope should prove his friend in the matter he had so much at heart. That Henry was in part governed by religious feeling, and also by considerations growing out of the subject of the succession, cannot reasonably be doubted; but his attachment to Anne Boleyn, which began some years before the

open agitation of the divorce question, was the real occasion of his wish to put away his wife, Anne being resolute in her determination not to be his mistress. Wolsey was opposed to the proposed marriage with Anne, and the king, without his minister's knowledge, sent his secretary to Rome, with a private proposition that a dispensation should be granted, allowing him to take a second wife, the former marriage to stand with no definite sentence passed upon it; or, if that were impossible, leaving the pope to proceed after his own ideas, the main object to be kept always in view. Wolsey's plan was, that the pope should extend his (Wolsey's) legatine authority so far as to grant him full power to act as English vicegerent so long as Rome should be held by the emperor's forces. Had the cardinal's plan been adopted, the difficulty would have been settled at once, as he would have divorced the royal couple as summarily as in after years Cranmer freed Henry from several of his wives. Soon, however, the public and private agents acted together, and the pope was urgently desired to do that which Henry asked. For years he played a double game, though warned by Wolsey and others of the evil that must follow to Rome from his failure to favor Henry. The subtle Gardiner showed him, with prophetic skill, the true map of the future, but in vain. In 1528 Cardinal Campeggio was appointed to proceed to England, to hear the cause in conjunction with Wolsey; but he purposely delayed his journey, and had instructions not to decide the cause. He endeavored to persuade the king to give up his wish, and failing, sought to induce Catharine to take the vows of chastity, and to retire from the contest; but that lady, who was singularly tenacious of her rights, would consent only on condition that the king should take the same vows. Henry, now convinced that only bold measures would answer, avowed his intention to make Anne Boleyn his wife, and installed her in Greenwich palace. He sent a relative of the lady to Rome, to announce that his request must be granted, menacing that, if he failed with the pope, the whole matter should be laid before parliament. The emperor sought to intimidate the king; but Henry summoned a meeting of nobles, merchants, and others, at London, before whom he placed the reasons of his conduct, and appealed to the patriotism of his subjects, with success. The imperial threats and intrigues proved very injurious to the queen's cause. The legatine court was prevented from acting by trickery until May, 1529, and then Catharine appealed to Rome, to which Henry was summoned. Against this Wolsey protested, declaring that if Henry should go to the court of Rome, it would be with such a force as should be formidable to the pope and all Italy. A parliament was immediately called, and power passed into the hands of new men, though of the old aristocracy, and Wolsey's enemies, and opposed to the rule of the church, yet not reformers in every case. At that time there were

3 parties in the country, viz.: the English party, in whose hands was power, and who were determined upon a secular revolt; the papal party, the chief member of which was Sir Thomas More, now chancellor; and the doctrinal Protestants, who were disliked by both the others. Wolsey gave up the seals, Oct. 18, 1529, and parliament met Nov. 3. The fact that the opening speech was made by More, an extreme Catholic, and standing on the occasion at the king's right hand, shows that Henry had even then no wish to break with Rome. Wolsey was coarsely reflected on by the chancellor. Parliament was left to pursue its own course, and it proceeded to denounce the clergy in a formal "act of accusation," or petition, which had been previously prepared, and which contained the germ of the English reformation. Henry submitted this to the bishops, who replied at length, but ineffectually, as the commons passed several laws respecting the powers and privileges of the clerical order; and the lords concurred, though the clergy formed a majority of the upper house, which shows that the pressure was great from without. The divorce question continued under discussion, and the pope issued two inhibitions, threatening Henry with spiritual censures if he should proceed. The king thought at one time of giving way, and most of the council agreed with him; but Thomas Cromwell, who was now rising to importance, induced him to persevere. Henry hoped the conduct of parliament would intimidate the papal court. The right of the pope to grant that dispensation under which the marriage of Henry and Catharine had taken place was called in question, the object being to transfer the matter to a broader court, and to obtain in some way, as through an appeal to a council, a decision against the marriage. This artful mode of proceeding is said to have been suggested by Cranmer, who made himself very prominent in obtaining the opinions of universities and learned men on the subject, and who belonged to the embassy of the earl of Wiltshire, sent to the emperor, at Bologna, in 1530. This embassy failed to move Charles. The pope still affected impartiality, and allowed free expression of opinion on the marriage in Italy; but his sole object was delay, and Spanish influence was exerted in the queen's behalf. In Catholic countries, the sentiments of learned men and other authorities on the dispensing power were about equally divided. The Protestants, including Luther, were generally hostile to Henry. In France and England Henry's cause triumphed, because all the influence of both governments was used in its behalf. The entire proceedings were scandalous. Wolsey had been prosecuted under the statute of provisors, and had died in disgrace; and it was determined to proceed against the higher clergy, but less in the spirit of justice—for the whole nation shared in their guilt—than to obtain an opportunity to strip them of some of their property, and to lessen their power. Convocation met in 1531, and consented to pay a fine of

£118,000, equal to \$6,000,000 of our money. In the preamble to their subsidy bill the clergy were compelled to acknowledge Henry as "protector and only supreme head of the church." They were then pardoned. The divorce question was brought before parliament for the first time in 1531, when the opinions of the universities were communicated to it. The house of peers sent a remonstrating letter to the pope, warning him of what would follow if a divorce should not be granted. Catharine was asked if she would withdraw her appeal to Rome, and on her firm refusal she was removed from the court. In 1532 parliament proceeded in the work of clerical reform, taking its first step toward a breach with Rome by the abolition of annates, which originated with the clergy, who, in order to preserve their own power at home, were ready to go any length against Rome, even while persecuting Protestants most intolerantly. Parliament was more moderate, and passed the act conditionally. From this time dates "the Anglican schism," the convocation praying to the king: "May it please your highness to ordain in this present parliament that the obedience of your highness and of the people be withdrawn from these of Rome"—that is, if the pope should insist upon the payment of annates. But this did not prevent parliament from limiting the legislative power of the convocation, in spite of the clergy's opposition. Meantime the num of Kent and other fanatics were inciting the people to opposition to the government, and a powerful party hostile to change was forming itself. Sir Thomas More resigned the chancellorship; and Archbishop Warham, after protesting against the doings of parliament, died. An offensive and defensive alliance between Francis and Henry was formed in 1532; the former agreed to send 15,000 troops to England, should the emperor invade that country; and he assisted Henry in various ways. Scotland gave England much trouble at this time. The English court visited that of France at Boulogne, and Francis made great promises of support, and advised Henry to marry Anne Boleyn on his return to England. New efforts were made to move the pope, but though he often affected to favor the king, and made some suggestions implying a desire to gratify him, he could not be prevailed upon to do any thing. At length, following Francis's advice, Henry married Anne Boleyn, Jan. 25, 1533, according to the generally received account, though it was believed that a secret marriage had taken place in the preceding November. A papal brief soon appeared, declaring Henry and Anne excommunicated, unless they should avoid all intercourse pending the decision of the divorce, the marriage being kept secret. Parliament met, and passed the act of appeals, directed against the papal authority, and intended to bear against Catharine's appeal to Rome. This took the matter before the convocation, and that body, on Cranmer's application, decided that Pope Julius II. in granting a license for the marriage of Henry and Catharine

had exceeded his authority, and that the marriage was therefore, *ab initio*, void. Cranmer then demanded the king's permission to proceed with the case, which being granted, he opened his court at Dunstable, and summoned Catharine to appear. She refused, and was pronounced contumacious, and the trial proceeded. Judgment was rendered May 23, 1533, the marriage being declared null and void from the beginning. Eight days later the coronation of Anne took place, and it was announced to Catharine that she should no longer be called queen, but princess dowager. There was much discontent, and the emperor, whom Henry in vain sought to appease, believed there would be an insurrection, and urged Catharine not to carry out her design of flying to Spain with her daughter. On May 12 Henry was summoned to appear at Rome, but he appealed to a general council. News of the divorce threw the pope into a rage, yet he contented himself at the time with a conditional excommunication, declaring Cranmer's judgment illegal, and giving Henry more than two months for repentance and restitution. Henry stood firm, but Francis failed to support him, and he had to look to the German Protestants for sympathy; and he sent an envoy to the elector of Saxony, with no effect. The princess Elizabeth was born Sept. 7, 1533. Conspiracies against the king were formed, implicating both Catharine and her daughter Mary; and the throne was in much danger from the ambition of some parties and the fanaticism of others. Government acted vigorously, and it was determined to form a Protestant league. Parliament met in Jan. 1534, and took a variety of measures to increase the separation of Rome and England, under Cromwell's lead. The papal authority was conditionally abolished in England. An act of succession was passed, settling the crown upon the children of Henry and Anne. At length the pope gave sentence, deciding against Henry, declaring him excommunicate, and freeing his subjects from allegiance. The emperor was to enforce the sentence, and invade England within 4 months; and preparations to that end were at once commenced. Francis showed himself friendly to Henry, and a meeting between them was prevented only by the latter's fear that a rebellion might break out during his absence. A French fleet guarded the channel through the summer. Henry's conduct was very energetic. Convocation declared that the pope had no more authority in England than any other bishop; convicted conspirators were executed; military preparations were made; the oaths of allegiance under the statute of succession were taken; and More and Fisher were imprisoned, and ultimately executed, for refusing to admit the king's supremacy. The act of supremacy was passed, making Henry head of the church, which act has been described as "the epitome of all the measures which had been passed against the encroachments of the spiritual powers within and without the realm," and as be-

ing "at once the symbol of the independence of England, and the declaration that thenceforth the civil magistrate was supreme within the English dominions over church as well as state." A new and sweeping treason act was passed. The first fruits were transferred to the crown. The new pope, Paul III., who, as Cardinal Farnese, had been on Henry's side, showed desire for a reconciliation, and the French king labored in the same direction; but the hour for England's divorce from Rome had come, and all negotiation was now useless. The execution of Fisher and More created a great sensation among Catholics. The pope issued a bull of interdict and deposition against the king. The union of the Protestants was now more earnestly sought than before, Henry aiming at the formation of a grand league. The visitation of the monasteries commenced in 1535, and the first suppression took place the next year. Catharine died at the beginning of 1536, and the fall of Anne Boleyn occurred 4 months later, when Henry married Jane Seymour. On Anne's death, new overtures came from Rome for a reconciliation, which failed principally through the indiscretion of Reginald Pole. The pilgrimage of grace occurred in 1536, being a popular outbreak, principally due to the suppression of the monasteries, and to the social changes that were going on. The dispute was settled by compromise, the government yielding to some of the demands of the insurgents. A second outbreak was put down by force, and many persons were executed. Edward, prince of Wales, was born Oct. 12, 1537, and Queen Jane died 12 days later. During 1538 there were conspiracies against the crown, for which many persons suffered, at the head of whom stood the marquis of Exeter, a grandson of Edward IV. Shrines were demolished, the chief one being that of Becket at Canterbury. The final dissolution of the monasteries took place in 1539, the same year that the six articles were adopted, forming the new church in England, and embracing the real presence, communion in both kinds not necessary to salvation, forbidding the marriage of priests, upholding vows of chastity, declaring that private masses should be continued, and providing for the continuance of auricular confession. This was followed by a persecution of the reformers. At the beginning of 1540 Henry married Anne of Cleves, a marriage that had been negotiated by Cromwell, in order to help to unite the Protestants of England and Germany; but the lady's unprepossessing appearance so disgusted the king that he soon procured a divorce, and in a few months Cromwell fell, and was sent to the scaffold. Henry took for his 5th wife Catharine Howard, niece of the duke of Norfolk, who was soon attainted and executed for adultery. He married a 6th time, taking Catharine Parr, widow of Lord Latimer, who survived him. The countess of Salisbury, last of the Plantagenets, was executed in 1541. A war broke out between England and Scotland, in which

the latter met with nothing but disgrace. England and the empire drew together again, and war was made by both with France. The emperor made peace with France in violation of his faith to England; but peace between England and France was not restored until 1546. Meantime Henry continued to persecute both Catholics and reformers, and many persons suffered death. Internal reform, however, also went on, and among other changes worship was performed in English. Extreme men on both sides were offended by the king's course, who sought to trim between them. An act of parliament vested the properties of all hospitals, colleges, and chantries in the crown, but this was to prevent the resumption of such properties after the dissolution of the monasteries, and not as preliminary to confiscation. Toward the close of Henry's reign the conservatives obtained the ascendancy in his councils, and persecuted Protestants with considerable zeal, though Henry, in his very last speech to parliament (Dec. 1545), spoke as favorably of toleration as any statesman of that age could speak of it. Some of the worst deeds of his reign occurred at this time. Anne Askew was racked and burned, Latimer was arrested, and an attempt was made against the queen. Henry's interference put a stop to the last of these doings, and he was on the point of going as far forward in his work as Elizabeth afterward went, when his reign came to an end. The danger to which Protestantism was exposed in 1546, through the course of the emperor, alarmed him, and he suggested to the Germans an offensive and defensive league, to be called "the league Christian," of which he should be the principal member and head. He was ready to settle all minor differences with the Germans on religion, and to present a solid front to Rome. Home changes were to be made, the chief of which was the change of the mass into the modern communion. The Germans did not respond well to his offers, and were overthrown by the emperor. Henry was now very ill, being unable either to stand or to walk, and he prepared to settle the government that should exist during his son's minority. The Catholic party was then conspiring to get possession of all power, headed by the earl of Surrey, who was accused of treason, condemned, and executed a few days before Henry's death; and his father, the duke of Norfolk, was attainted by parliament, which met Jan. 14, 1547, and is supposed to have escaped the scaffold only because of the king's death, which happened at 1 o'clock on the morning of the 28th. As his end approached he signified his wish to see Cranmer, who did not arrive until the king had become speechless. The archbishop spoke to him, and, asking him to give him some token that he put his faith in God through Jesus Christ, the king wrung his hand hard, and died. His will, which provided that daily masses should "be said perpetually while the world shall endure," at an altar to be erected near his tomb and that of Queen

Jane, had been completed 4 weeks before his decease. He bequeathed the crown to his son and his issue, and, failing them, to such issue as he might have of his queen Catharine (Parr), or any other lawful wife whom he might marry. Failing such issue, it was to descend to Mary and her heirs, and then to Elizabeth and her heirs, provided they married not without the consent of their brother, or of the council appointed for his guardianship. Finally, and passing over the Scottish line, it was to go to the children of his sister Mary's two daughters. The government selected for Edward's minority was composed of men from both parties, the king adjuring them, and all his subjects, to carry out his intentions. Henry's reign has often been called a tyranny, but such it was not, so far as the mass of the people was concerned, as he had, more than once, to yield to the bold expression of the popular will. He was allowed, however, to do as he pleased with the aristocracy, and he never encountered opposition when he glutted the scaffold with the noblest of victims. His reign was the seed time of modern English parties, and its history has been written in a partisan spirit which has greatly obscured it.

II. FRANCE.

HENRY I., the 3d French king of the Capetian dynasty, born about 1011, died Aug. 4, 1060. As early as 1027 he was associated in the government by Robert, his father, whom he succeeded in 1031, notwithstanding the rebellion raised against him by his stepmother Constance. This he quelled through the assistance of Robert the Devil, duke of Normandy. Henry's weakness encouraged his vassals to rebel, and he had more than once to take the field against them; he was even, toward the end of his reign, embroiled in a war with his former ally, the duke of Normandy; but the hostilities were soon terminated by a treaty of peace (1059). During his reign, France was afflicted by a dreadful famine and by many private wars. The latter curse the church, which was then the paramount power, attempted to allay by enforcing agreements known as the "peace of God" and "truce of God;" but Henry declined to abide by them. He was married 3 times, and had by his last wife, Anna, daughter of Jaroslav, grand duke of Russia, Philip, who was his successor, and Hugh, who became count of Vermandois.

HENRY II., 10th king of the Valois family, born in St. Germain-en-Laye, March 31, 1519, died in Paris, July 10, 1559. The only surviving son of Francis I. by his queen Claude of France, he succeeded his father, March 31, 1547, and, adhering to the same policy, engaged abroad in the great struggle to destroy the ascendancy of the house of Austria, while he persecuted the Protestants at home. Being entirely under the control of his mistress, Diana of Poitiers, who acted in concert with the great constable Montmorency and the brothers Guise, he had many of the Protestants arrested, tried, and burned

at the stake in Paris, Lyons, Angers, Blois, and Bordeaux. By his edicts of Châteaubriant (1551) and Écouen (1553) the punishment of death was decreed for attendance at secret religious meetings. In 1557 ecclesiastics, under the title of inquisitors, were introduced into the parliaments to sit as judges in all cases against heretics. Finally, in 1559, two members of the parliament of Paris, Du Faur de Pi-brac and Anne Du Bourg, having been bold enough to advocate in his presence the liberty of conscience, were incarcerated, and Du Bourg was afterward publicly hanged and burned. These bloody measures were the forerunners of religious wars. Henry's foreign policy was partially successful. The English, who were then in alliance with the emperor Charles V., were desirous of securing the union of Scotland by the marriage of young Edward VI. with Mary Stuart; French troops were sent to Scotland, and Mary was brought to France and affianced to the dauphin Francis. Meanwhile the city of Boulogne was besieged, and England gave it up in 1549, for one third of the sum which had been stipulated for its surrender. In Italy, Henry protected Ottavio Farnese, duke of Parma, against the imperial troops, and in 1552 became the ally of Maurice of Saxony and the other Protestant princes who were struggling to throw off the yoke of Charles V., and soon after seized the episcopal cities of Metz, Toul, and Verdun. Charles, having concluded the treaty of Passau with his German opponents, tried to reconquer those cities, and in 1553 made a fruitless attack upon Metz, which was defended by François de Guise, and avenged his defeat by pillaging Picardy, but was once more defeated at Renty in 1554. The French at the same time were successful in Italy, where Brissac conquered Savoy and Piedmont. Charles having abdicated in favor of his son Philip II., a 5 years' truce was signed at Vauxcelles in Feb. 1556. Henry II., however, soon renewed the war, but fortune did not now attend his arms; the duke of Guise was foiled in his attempt against the kingdom of Naples by the superior ability of the duke of Alva, and the constable Montmorency was totally defeated near St. Quentin, in 1557, by Duke Philibert Emmanuel of Savoy. Had Philip II. improved the opportunity, Paris would have been taken; but his delay gave time to his rival to make preparations for defence; and Guise, being recalled from Italy, revenged the disgrace of Montmorency's defeat by the conquest of Calais in 1558, the only place that the English still possessed on French soil. The Spanish troops under Egmont, however, having won a new victory, Henry II., weary of war and yielding to the entreaties of his mistress, concluded, April 3, 1559, the disastrous peace of Cateau-Cambrésis. He kept indeed Calais, Metz, Toul, and Verdun, but consented to restore all his conquests in Italy and the Netherlands, including no fewer than 198 strong places. Henry's daughter Elizabeth was to be married to Philip, and his sis-

ter Margaret to the duke of Savoy. During the festivities which were held in Paris to celebrate the peace and the double marriage, Henry II. was mortally wounded in a tilt with Montgomery, the captain of his guards, and his sceptre passed to his eldest son, Francis II., the husband of Mary, queen of Scots.

HENRY III., the last king of the Valois family, born in Fontainebleau, Sept. 19, 1551, assassinated Aug. 2, 1589. He was the 3d son of Henry II., and the favorite of his mother, Catharine de' Medici, and in his youth bore the title of duke of Anjou. Being placed at the head of the Catholic army in the reign of Charles IX., he won, in 1569, the victories of Jarnac and Montcontour over the Protestants. He participated in the councils that brought about the St. Bartholomew massacre in 1572. His military reputation, aided by his mother's intrigues, procured his election to the throne of Poland in 1573; but his refined and effeminate habits were distasteful to the Poles, while he himself disliked their independent spirit and coarse manners. On hearing of the death of his brother Charles IX. in 1574, he secretly escaped and returned to France, passing through Vienna and Venice. His arrival was marked by the renewal of civil war. The Protestant party, being strengthened by their alliance with that party of Catholics known as the *Politiques*, had taken up arms; their German auxiliaries were however defeated at Dormans, Oct. 11, 1575, by the duke of Guise; and the king, fearful of the growing popularity of that prince, hastened to conclude the peace of Beaulieu, in May, 1576, the terms of which were so favorable to the Protestants as to be considered a betrayal of the Catholic cause. This gave rise to the holy league, which, under pretence of protecting religion, aimed chiefly at furthering the ambitious designs of the house of Guise. Henry attempted to avert the danger by declaring himself chief of the league during the session of the states-general, which met at Blois in Dec. 1576; but the association clung faithfully to Guise as their leader, and made use of their majority in the states to curtail the prerogatives of the king and force him into another war against the Protestants. After reluctantly carrying it on for a few months, he put an end to it by the treaty of Bergerac, Sept. 17, 1577, and tried by conciliatory measures to win over the most influential of the Catholics. This policy was of little avail; the "lovers' war," as it is called, broke out, which he however succeeded in bringing to an early conclusion by the treaty of Fleix, Nov. 26, 1580. A momentary lull occurred; but the king became more and more unpopular by his unbounded licentiousness and prodigality. On the death of his younger brother, the duke of Alençon, by which the succession to the crown reverted to the Protestant Henry of Navarre, the spirit of the league rekindled; the association extended all over the provinces, and became more formidable than ever; the majority of the nation

was indeed adverse to accepting as heir apparent a prince who was not a Catholic. Henry III., although not sharing this popular prejudice, was obliged to go to war with his future successor, and assembled 4 armies. By thus increasing its burdens he hoped to make the nation weary of the contest, while he exerted his ingenuity to make such combinations as would thwart the projects of the league. His favorite Joyeuse, however, was defeated by the king of Navarre at Coutras in 1587, and his own unpopularity increased, the league making him answerable for the reverses which befell the Catholic party. On all sides he was denounced as a traitor, and his deposition was publicly advocated. The duke of Guise was recalled to Paris by his adherents, and, notwithstanding repeated orders from the king, triumphantly entered the capital. Henry having summoned troops for his own defence, the Parisians raised a formidable rebellion; barricades were constructed, May 13, 1588; and the king barely escaped from his ambitious rival. He immediately convoked the states-general at Blois, in the hope of finding support among them; but the majority was still against him; his life and crown were at stake; he resorted to violent means, and on Dec. 23, 1588, caused the duke of Guise to be murdered in his own apartment by his body guards, the "forty-five." This was a new incentive to the league. Henry, branded as an assassin, anathematized by the pope, deposed by decrees of the Sorbonne and the parliament, had no other resource but to unite with Henry of Navarre, and both marched in concert against Paris, the principal seat of the league. During the siege of that city, a Dominican monk, Jacques Clément, whose fanaticism had been encouraged by Guise's own sister, the duchess of Montpensier, presented himself at St. Cloud to the king as the bearer of an important letter, and stabbed him mortally with a knife. With Henry III. the Valois family became extinct, and the Bourbons ascended the throne of France.

HENRY IV., the 1st French king of the house of Bourbon, born at the castle of Pau, Dec. 14, 1553, assassinated in Paris, May 14, 1610. The son of Antoine de Bourbon and Jeanne d'Albret, queen of Navarre, he was brought up by his mother in the Protestant religion, carefully educated, and inured to hardship. As early as 1569 she took him to the Protestant army before La Rochelle, and placed him under the control of Admiral Coligni. He was present at the battles of Jarnac and Moncontour, both disastrous to his party. He distinguished himself in the military operations in southern France, which were terminated by the peace or edict of St. Germain in 1570. The seeming reconciliation of the Protestant and Catholic parties was to be sealed by the marriage of young Henry with Margaret, the sister of King Charles IX.; it was agreed to in April, 1572, and notwithstanding the sudden and unexpected death of Jeanne of Navarre, which occurred in June under very suspicious circumstances, the ceremony was

performed on Aug. 17, 7 days before the massacre of St. Bartholomew. A number of eminent Huguenots had congregated in Paris to participate in the matrimonial festivities, and were slaughtered during the bloody night of Aug. 24. Henry himself, a prisoner in the Louvre, saved his life by abjuring his faith. For nearly 4 years he was detained at court, strictly watched, dissembling his real sentiments under the cover of levity. At last, Feb. 2, 1576, he succeeded in making his escape, took refuge first in Alençon, then crossed the Loire at the head of a number of his adherents, revoked his abjuration, took command of the Protestant troops, and successfully carried on hostilities against the Catholics, which brought about the peace of Beaulieu, May 4, 1576. The states-general at Blois having issued coercive decrees against the Huguenots, Henry took up arms again, but peace was concluded at Bergerac, Sept. 17, 1577. On the breaking out of the "lovers' war" in 1580, of which he gave the signal, and was indeed the soul, he inspired his adherents with confidence and ardor, and accomplished deeds of heroic valor at the siege of Cahors, which city he stormed after a tremendous fight of 4 days' duration. He thus gained a high position, not only among his own party, but in the eyes of his opponents. The death of his mother in 1572 had left him king of Navarre, and on the death of the duke of Alençon, or rather of Anjou, youngest brother of Henry III., June 10, 1584, he became heir apparent to the French crown. He was then 31 years of age. Deserted by Henry III., who yielded to the paramount influence of the duke of Guise, proscribed by the Catholic party and the league as a heretic, excommunicated by Pope Sixtus V., his cause seemed desperate; but although his troops scarcely numbered one tenth as many as the Catholic army, he soon took the field with his wonted courage. The victory of Coutras, Oct. 20, 1587, greatly bettered his fortunes, although it was followed by the defeat of several auxiliary troops sent to him by the German princes. The *journée des barricades*, when Henry III. was compelled to flee from Paris and to leave his metropolis in the hands of the rebellious duke of Guise, brought about a reconciliation between the kings of France and Navarre, who united their forces to oppose the league, and in concert laid siege to the capital. The assassination of Henry III. greatly increased the difficulties of Henry of Navarre. He was at once deserted by the Catholic nobles who supported the cause of his predecessor, but who, notwithstanding their devotion to royalty, would not accept a Protestant king; the league at the same time raised against him his uncle, the cardinal of Bourbon, whom they proclaimed king under the title of Charles X.; and the nation itself evinced no partiality for Henry. He was obliged to raise the siege of Paris, was pursued through Normandy by the duke of Mayenne, and seemed to be in imminent danger, when he thwarted the hopes of his enemies by

his heroic stand near the castle of Arques; notwithstanding their large superiority in point of numbers, they were obliged, Oct. 6, 1589, to beat a retreat, leaving from 1,000 to 1,200 men on the battle field. Henry, quickly returning to Paris, seized its suburbs, but could not take possession of the city itself for want of artillery. Another and still more decisive victory over Mayenne, that of Ivry, which he won March 14, 1590, once more opened before him the road to the capital, which he blockaded for several months, and had reduced to the last extremities, when it was relieved by the approach of a Spanish army under Alexander Farnese, duke of Parma. For two years longer the war was carried on with varied success, Henry being more than once worsted by his opponents, but, amid the most trying circumstances, showing such perseverance, ingenuity, and valor as to uphold the drooping spirits of his followers. A favorable change in his fortunes became apparent during the year 1593. Discord prevailed among his enemies; the ambitious designs of Philip II. of Spain, who openly manifested his desire of placing his daughter on the throne of France, inspired the French Catholics, and even the leaguers, with distrust and anger. A better feeling grew up among the people, who, being weary of so protracted a war, instinctively leaned toward the prince from whom alone peace could be expected. Every thing showed him that the time had come for a decisive step; and he therefore abjured Protestantism at St. Denis in July, 1593, and was crowned at Chartres, Feb. 17, 1594. Thus the strongest obstacle in his way was removed: the majority of the nation at once sided with him. Paris surrendered, March 22, and within a few months most of the Catholic governors of the provinces and cities also submitted. Mayenne still held Burgundy with the assistance of Spanish troops; but the great constable of Castile having been defeated at Fontaine-Française, June 5, 1595, negotiations were entered into, and the duke, swearing allegiance to Henry, kept the governorship of the province. Picardy was meanwhile in the hands of Spain, against which war had been formally declared; the king led his army against Amiens, and, notwithstanding the presence of the Spanish army under the archduke Albert, forced that city to capitulate (1597), and the next year brought to submission the duke of Mercœur, who had heretofore acted as an independent sovereign in Brittany. France was now wholly under his control; he gave her peace at home by the celebrated edict of Nantes, April 15, 1598, and abroad by the treaty of Vervins with Spain, May 2. Henry now perseveringly pursued the policy of restoring order and prosperity to his kingdom, strengthening the royal authority, and placing France in a respectable position abroad. In this laborious task he was especially assisted by the duke of Sully. Agriculture, mining, commerce, and manufactures were encouraged; roads were opened and repaired; the army re-

ceived a better organization, while strong fortresses were built along the N. and E. frontiers; the navy, which had been neglected, was improved, and attention was paid to the French colonies in America. In short, improvements were made in every branch of the public service. The ambitious aspirations of provincial governors were effectually checked; political conspiracies were severely punished; municipal franchises and immunities, that had been revived or extended during the civil wars, were curtailed; and obedience to the king became the order of the day. After the death of his celebrated mistress Gabrielle d'Estrées, having procured the dissolution of his former marriage with Margaret of Valois, Dec. 1599, Henry married Maria de' Medici, the niece of the grand duke of Tuscany, which secured his influence among the Italian princes. A short war with the duke of Savoy put him (1601) in possession of several valuable districts on the E. frontier. A formidable conspiracy having been plotted by the duke of Bouillon and the count of Auvergne, in conjunction with Marshal Biron, who also maintained secret relations with Spain and Savoy, Henry had his old companion in arms arrested, tried before the parliament, and beheaded, July 31, 1602. A few years later, the count of Auvergne, having engaged in new intrigues, was incarcerated in the Bastille: and the duke of Bouillon, the constant promoter of rebellions among the Protestants, was dispossessed of his principality of Sedan, and would even have lost his life but for Queen Elizabeth's entreaties. His power being thus firmly established, he resumed the political designs of Francis I. and Henry II., allied himself with German Protestant princes, and made preparations for a fresh war against the house of Austria. It is even said that he aimed at nothing short of an entire reorganization of Europe, which, according to his plans, would have formed a kind of "Christian commonwealth or confederation," consisting of 15 large states—5 hereditary monarchies, 6 elective kingdoms, and 4 republics—under the direction of a supreme council, called the "senate of the Christian commonwealth." However this may have been, he was on the eve of leaving Paris to take the command of the French army in the north, when, while taking a ride through Paris, May 14, 1610, he was stabbed to the heart by the fanatic François Ravallac. His death was regarded as a national calamity. Henry's children, by his second wife, were Louis XIII., who succeeded him; Gaston, duke of Orleans; Elizabeth, who married Philip IV. of Spain; Christine, who became duchess of Savoy; and Henrietta Maria, the wife of Charles I. of England. César, his natural son by Gabrielle d'Estrées, was the founder of the house of Vendôme, and grandfather of the celebrated duke who distinguished himself under Louis XIV. The high capacities of Henry IV., as well as his shortcomings and "amiable faults," have always been well known; it is but recently, however,

that his ready wit and charming style have become fully appreciated from the publication of his *Lettres missives*. This correspondence, which will consist of 9 vols. 4to., the 7th of which appeared in 1858, is published by M. Berger de Xivrey in the *Documents inédits sur l'histoire de France*.

III. GERMANY.

HENRY I., king of Germany, surnamed the Fowler or Falconer (*der Finkler* or *Vogler*), the 1st of the line of Saxon sovereigns of Germany, born in 876, died in 936. He was the son of Otho the Illustrious, duke of Saxony, upon whose death he succeeded to the dukedoms of Saxony and Thuringia. His father had been elected in 912 to the sovereignty of Germany, but had caused Conrad, duke of the Franks, to be elevated in his stead. This sovereign undertook to deprive Duke Henry of part of his inherited estates, but the latter fought his enemy at Eresburg (modern Stadberg), and compelled him to acknowledge all the ducal rights of Saxony and Thuringia. Conrad discovered the great qualities of his opponent, and, having been mortally wounded in an expedition against the Hungarians, sent overtures to Henry with the sacred arms and crown of the German sovereigns. The envoys, it is said, found the duke in the Hartz mountains, with a falcon upon his wrist, and this, according to tradition, was the origin of his surname. Henry's election was formally declared in 919, by the nobles of Franconia and Saxony. The dukes of Swabia and Bavaria refused their homage, but were speedily brought to submission. Henry also conquered Lorraine, which had hesitated to accept him. He erected the fief into a duchy, giving his daughter in marriage to Duke Gisbert; and having thus consolidated the sovereignty of Germany, he turned all his attention to arresting the Slavic and Hungarian inroads. The Hungarians advanced into the very heart of Saxony (924). Their leader was captured; and the best terms Henry could obtain was a truce of 9 years in exchange for the restoration of the captured general, and a promise of the continuance of the yearly tribute. Henry made the most of the truce by organizing his army, building castles, fortifying cities, and reducing Brandenburg, together with the tribes upon the Eider and the Elbe, and extending his rule to Prague. From this period dates the fealty of the Bohemian princes to Germany (929). On the expiration of the truce war with the Hungarians was renewed, and Henry gained a complete and decisive victory on the banks of the Saale (933), which for the time relieved Germany from all danger of invasion. In 934 he defeated the Danes, who were ravaging the coasts of his northern provinces. He reigned 18 years, and during that period elevated the kingdom to the height of power and command. He was the terror of enemies, but mild, just, and kind to friends and subjects. The municipal privileges which he granted were the foundation of the Germanic corporations.

HENRY II., emperor of Germany, great-grandson of the preceding, surnamed the Lamé, and in a subsequent age the Saint, born in 972, died in 1024. He was the 5th and last German sovereign of the line of Saxony. He became duke of Bavaria in 995, succeeded his cousin Otho III. upon the imperial throne in 1002, and was crowned at Rome in 1014. His reign was an uninterrupted series of contests with his great vassals, and against Slavic tribes and the Hungarians, whom he labored with much success to convert to Christianity. His zeal in the propagation of the faith, his submission to the church, and his liberality to the clergy, obtained for him from Pope Eugenius III. a place in the calendar of saints. His surname of the Lamé was gained by spraining a foot in leaping from a window to escape an attack by the people of Pavia, whose affection he thought to win by dismissing his principal body guard after his reduction of the city (1004). He was rescued by his troops, encamped outside the walls.

HENRY III., emperor of Germany, surnamed the Black, the Bearded, the Old, and the Pious, born in 1017, died in 1056. He was the son and successor of the emperor Conrad II., having been elected during his father's life. He succeeded accordingly in 1039. No emperor since Charlemagne sustained himself with more vigor or dignity throughout his reign. He repeatedly and successfully interfered in the affairs of Hungary, and a portion of that country (from Kahlenburg to the Leitha) was definitively united to Austria. Three claimants at this time were contesting the papal tiara. Henry summoned a council at Sutri in 1046, deposed them all, and created a German bishop of Bamberg (Suidger) pope, under the title of Clement II. He subsequently gave 3 successive German popes to Rome, reserving to himself a thorough control of the spiritual administration. The temporal princes he held at the same time in actual subjection, transforming the German empire into a monarchy of which the elected sovereign was absolute ruler. He promoted education, and encouraged art and science. He obtained the admiration of his subjects by challenging Henry I. of France to mortal combat, for having accused him of breaking his word. His first wife was daughter of Canute, king of England.

HENRY IV., emperor of Germany, son of the preceding, born in 1050, died in 1106. He was but little over 5 years old when his father died, and the regency was at first intrusted to his mother, Agnes of Aquitaine; but her authority was overthrown by the nobles, and she retired to Rome, while Henry was taken to Cologne by the archbishop Hanno. Shortly afterward he became the pupil and ward of Archbishop Adalbert of Bremen, from whom he imbibed principles of hostility against the temporal lords, especially those of Saxon descent, which embittered his whole reign. At 15 he was declared of age, and in the following year (1066) was removed by the nobles from the immediate control of Adalbert. The counsel and

instructions of the archbishop, however, were never forgotten, and Henry soon manifested a hatred of the Saxons by acts of oppression and violence. He had already espoused Bertha, the daughter of an Italian prince of Susa, and now sought to be divorced from her. The pope manifested opposition, and Henry, after vainly resorting to unworthy means for the accomplishment of his wishes, at length, with characteristic instability, became reconciled to his young wife, whose noble conduct subsequently won and retained his affection. Meanwhile the exasperated nobles of Saxony rose against the emperor, drove him from his favorite abode at Goslar, and successively from other Saxon strongholds which he had built. Henry was compelled to seek safety in flight, and for 3 days wandered in the Hartz without food. Under the guidance of a mountaineer, he at length escaped to the Rhine, assembled an army, defeated the Saxons, and desolated their country with fire and sword. Other princes of the empire now interfered, and the Saxon nobles, after public humiliation upon their knees, were admitted to mercy. Many of them, however, were retained as prisoners, and their fiefs were made over to other vassals. Henry rebuilt his Saxon fortresses, and by his arrogance and extortion planted anew the seeds of revolt. Meanwhile he was suddenly commanded by Pope Gregory VII. (Hildebrand) to appear at Rome to answer for crimes laid to his charge, upon penalty of excommunication. Henry's indignation vented itself for the moment in a missive addressed to the "false monk Hildebrand," informing him of his deposition by the German prelates (Worms, 1076), and of his excommunication by judgment of the same assembly. The pope immediately issued sentence of excommunication. Henry soon learned the necessity of submission. Deserted and threatened by the majority of the German princes, he hastened to Italy, accompanied by his wife and a single attendant, and humbled himself before the pope in the most penitential manner. Clad in a shirt of hair, and barefooted, he was compelled, it is said, to pass 3 whole days in an outer court of the castle of Canossa, in midwinter, awaiting Gregory's permission to appear before him. On the 4th day he was admitted and received absolution. With this, after finding adherents among the Lombards, his courage and resentment alike revived. He began a war with the sword and with the pen, which for 30 years he sustained with the greatest skill and determination, and in which for the most part he maintained the ascendancy. Such were the opening scenes of the long and violent contest concerning investitures—a conflict between state and church which was destined to rage for half a century, and which, subsequently resumed, was protracted until 1268. During Henry's absence the German princes had deposed him, and elected Rudolph of Swabia, in a diet at Forcheim (March, 1077); but there were yet cities and bishoprics in Germany which remained faithful,

and Henry found himself able to make war. Rudolph was forced to retire from Swabia, which duchy, together with the hand of his daughter Agnes, Henry bestowed upon a bold adherent, Count Frederic of Buren, who soon built his castle on the summit of Mt. Staufen, and founded thus the greatness of the race of Hohenstaufen. The war raged fiercely meanwhile in the fairest regions of Germany. The pope, not sorry to find the rival emperors consuming their strength against each other, is supposed to have fostered the quarrel for his own purposes. At length, reproached by the Saxons in terms which seemed to brook no further delay, he sent the crown to Rudolph, and again excommunicated Henry. The latter, in turn, again declared the pope deposed, and caused an antipope, Clement III., to be elected. At this period (1079) fortune appeared to favor Henry: but in the following year he lost a great battle in Saxony, near Gera. In the action, however, Rudolph was slain by Godfrey of Bouillon, the hero of the first crusade. The fall of Rudolph, although the victory was won by his army, was considered a judgment of God, and the effect was to enlist an immense increase of numbers in the service of Henry, who now marched upon Rome, and besieged it with short intervals during 3 years. Gregory, in great extremity, retreated into the castle of St. Angelo, and Henry contented himself with a coronation by his own pope, Clement (1084). Robert Guiscard, the Norman duke of Calabria, at length approached from lower Italy, and Henry retired, leaving Rome to be plundered by the Normans, and Gregory to be rescued by them from his own people, who had laid siege to the castle. Hermann of Luxemburg succeeded Rudolph in the rival emperorship, and Victor succeeded Gregory in the rival papacy (1085); but neither could withstand the power of Henry. Hermann soon resigned his dignity, and his successor, Egbert of Thuringia, having been assassinated, the Saxons submitted. Henry's eldest son, Conrad, whom he had named king of the Romans, was now gained over by the papal party. He was deposed, and died in 1101. His defection was followed by that of his brother Henry, who, in view of the renewal of the papal ban against his father by both Urban and Pascal, who had in turn succeeded Victor, resolved to support the church. He affected reconciliation, however, and the emperor, having been treacherously seized and carried prisoner to Ingelheim, was compelled by the prince to resign his throne. Henry escaped from prison, and sought an asylum at Liège, where he soon died.

HENRY V., emperor of Germany, surnamed the Young, second son of the preceding, born in 1081, died in Utrecht, May 22, 1125. His filial ingratitude and treachery are noticed in the account of Henry IV., whom he succeeded in 1106. Notwithstanding his revolt against his father, he acted from the outset of his reign according to the principles of the late emperor, and in defiance of the pope he claimed the right

of investiture. Having espoused Matilda, daughter of Henry I. of England, he was able by means of her dowry to proceed to Italy with great magnificence and in strong military force, in order to be crowned by the pope. The pontiff, Pascal II., had made propositions of compromise in regard to the dispute concerning investitures, and the subject was to be adjusted in solemn assembly in the church of St. Peter; where, however, an angry discussion among the bishops was followed by the seizure and imprisonment of the pope and cardinals. Henry's army, which was encamped around the church, was attacked by the enraged Romans, and in a furious battle the emperor's life was with difficulty saved, and at the expense of his own, by Count Otho of Milan. The Romans, after a hard-fought day, were driven into the city, and after Henry had ravaged the surrounding country, the pope purchased his own liberty and the salvation of the city by consenting solemnly to the imperial right of investiture, declaring at the same time that Henry should not be excommunicated. The latter clause was incorporated in the treaty, and the emperor was crowned in St. Peter's, April 13, 1111. Scarcely had he taken his departure, however, when Pascal denounced the treaty as having been extorted by force. The dispute, thus renewed, was protracted with great animosity during the following 10 years. Henry was excommunicated by the successors of Pascal, and defeated in northern Germany, where the princes refused obedience. In Saxony also the emperor lost all authority. He headed a second expedition against Rome, created an anti-pope, Gregory VIII., but at length saw the necessity of abandoning his claim, and subscribed the famous concordat of Worms (1122), by which he surrendered the investiture with ring and crosier as tokens of spiritual jurisdiction, and agreed to permit the free choice of the German bishops, whose election, however, was to take place in presence of the emperor or of his plenipotentiary. It was moreover agreed that in doubtful elections, or in electoral disagreements, the decision should lie with the emperor, whose imperial authority, in connection with the temporal possessions of the churchmen, was at the same time solemnly acknowledged. The concordat, virtually a compromise, was received throughout Europe with great joy, and the remainder of Henry's reign was passed in peace with the church; but dissensions prevailed everywhere throughout his dominions. He formed plans for strengthening the imperial power, but was cut off suddenly by a contagious disease. With him the race of Salian or Franconian princes became extinct. His hereditary possessions fell to the sons of his sister Agnes, Frederic and Conrad of Hohenstaufen; and the imperial crown was conferred upon Lothaire of Saxony.

HENRY VI., surnamed the Cruel, emperor of Germany, son and successor of Frederic I. (Barbarossa), born in 1165, died in Sicily, Sept. 28, 1197. He had been crowned king by the

Lombards in 1185, and was also during his father's lifetime named successor to the imperial throne. In 1186 he married the Norman heiress, Constance of Naples and Sicily. Upon the death of Frederic in Syria (1190), Henry, who had been invested with the government during his father's absence, succeeded without opposition. But the return from England of Henry the Lion of Brunswick, who had been temporarily exiled by Frederic, provoked new wars, which were at length terminated by the marriage of the son of the duke with Agnes, princess palatine, cousin to Henry. In 1192 King Richard of England (*Cœur de Lion*) was shipwrecked on the coast of Italy on his return from the Holy Land, and travelling homeward in disguise through Germany was recognized and imprisoned by Henry's order at Trifels for more than a year, in punishment for an insult offered in Palestine to the standard of the German leader, Duke Leopold. Soon after this the emperor proceeded in great force to Naples and Sicily to secure the inheritance of his consort. His cruelty to the Italian nobles who had rebelled, and the extortion which he practised on this occasion, rendered him so odious, that his sudden death is generally attributed to poison. Constance has been accused of the murder. At the period of his death, Henry was preparing for an expedition against the Greek empire, as a preliminary enterprise to a new crusade.

HENRY VII., of Luxemburg, emperor of Germany, born in 1262, died in Buonconventi, near Sienna, Aug. 24, 1313. He was elected emperor in 1308, after an interregnum of 7 months which followed the death of Albert I. His reign was short, but respectable. After punishing the murderers of his predecessor, and after the marriage of his son John with the heiress of Bohemia, he proceeded to Italy, which was distracted by the wars of the Guelphs and Ghibellines, and, having compelled the Milanese to consent to his coronation with the iron crown of Lombardy, he reduced the whole of northern Italy, and continued his march southward to Rome, of which King Robert of Naples held military possession. Among other distinguished men who came forward at this period to do homage to the emperor, was Dante, who presented a Latin discourse upon the imperial dominion, and, as a devoted Ghibelline, besought Henry to exert his power vigorously against his enemies. After the reduction of Rome, and the imperial coronation by cardinals (the pope, Clement V., having transferred the holy see to Avignon in 1309), Henry placed the Neapolitan king Robert under the ban of the empire, and was about to march against Naples when he died suddenly, poisoned, it was affirmed, by a priest in the administration of the eucharist.

HENRY, surnamed the Lion, duke of Saxony and Bavaria, born in 1129, died in Brunswick in 1195. His father, Henry the Proud, had been outlawed and despoiled of his possessions for refusing to acknowledge the election of the emperor Conrad III. He died soon after, leav-

ing a son 10 years of age, to whom (as the Saxons had never succumbed to the decision of Conrad respecting their late duke) Saxony was speedily restored. At the diet at Frankfort (1147) he formally demanded restitution of all his possessions, Bavaria having been bestowed upon Leopold, margrave of Austria. Conrad refused, and a war ensued, the results of which in the main were favorable to Henry. Frederic Barbarossa meanwhile succeeded Conrad (1152), and one of his first acts was to restore to Henry the Bavarian duchy. Henry's dominions, including part of modern Pomerania, now extended from the Baltic and North sea to the Danube. He was the head of the house of Guelph, and in all respects the most considerable of the German princes. He triumphed over a confederacy of church potentates who conspired against him in his own dominions; and in 1168 he espoused Matilda (or Maud) of England, sister of Richard Cœur de Lion. Under him Lübeck, founded a few years before (1140), was built up into a powerful city. Hamburg, which had been destroyed by the Wends, was rebuilt. Munich was founded. Improvements were everywhere encouraged in education and industry. He had in the mean time become unpopular with neighboring princes and bishops, who threatened to arrest his growing importance. He attacked them, devastated Thuringia, reconquered Bremen, and, having restored tranquillity along his frontiers, made a pilgrimage to the Holy Land (1172). Feeling now sufficiently powerful to decline service in the imperial expeditions in Italy, he withdrew his forces at a critical moment; and the immediate consequence of the defection was the overthrow of the emperor at Legnano (1176). Frederic's revenge was not long delayed. On his return from Italy, after the peace of Venice, in 1178, he summoned the duke to appear before him at a diet at Worms. The summons, thrice repeated, was unheeded, and the contumacious prince was declared deposed, and under the ban of the empire. His fiefs were parcelled out among other princes, who marched in league to take possession. Henry beat them off, but the arrival of the emperor with overwhelming force compelled him to retire to Lübeck, and at length into Holstein. He was forced soon after to humble himself at the feet of Frederic (1181), who banished him for 3 years to England. There he became the father of a son, from whom the British Hanoverian sovereigns trace their descent. He was meanwhile reinstated in his hereditary possessions of Brunswick and Lüneburg, and at the end of the 3 years recrossed the channel to take personal possession. Frederic, however, obliged him to withdraw again to England (1184). Five years later, in consequence of asserted violation, by the imperial authorities, of his hereditary dominions, he returned to make war for their absolute recovery. Frederic died in 1190; when, after making peace and entering into a family alliance with Henry VI., by the marriage of his son with

Agnes, cousin of the emperor (an alliance which seemed naturally to promise a termination of the great Guelph and Ghibelline feud), the Saxon duke was at length enabled to repose.

HENRY, CALEB SPRAGUE, D.D., an American clergyman and author, born in Rutland, Mass., Aug. 2, 1804. He was graduated at Dartmouth college in 1825, and after having pursued a course of theological studies at Andover and New Haven, he was settled in 1828 as a Congregationalist minister at Greenfield, Mass. In 1831 ill health obliged him to suspend the exercise of his ministry, and he spent two years at Cambridge, Mass., in the study of philosophy. In 1833 he was settled in Hartford, Conn. In 1834 he published a pamphlet on the "Principles and Prospects of the Friends of Peace." About this time he also established a journal called the "American Advocate of Peace," which after the first year became the organ of the American peace society. In 1835 he removed to New York, where he took orders in the Protestant Episcopal church. Soon afterward he was appointed professor of intellectual and moral philosophy in Bristol college, Penn. In 1837 he returned to New York, and in conjunction with Dr. Hawks founded the "New York Review." In 1839 he became professor of philosophy and history in the New York university. He published in 1845 an "Epitome of the History of Philosophy," which had been prepared by the abbé Bautain for the university of France. This work Dr. Henry translated and continued from the time of Reid down to the date of its publication. He has also published a translation of Cousin's lectures on Locke's "Essay on the Human Understanding," with notes and additional pieces; this work appeared under the title of "Cousin's Psychology" (Hartford, 1834), and in 1856 it had reached a 4th edition, revised and enlarged. In 1847 he took the rectorship of St. Clement's church, New York. His health failing, he resigned his parochial charge in 1850, but retained his professorship, and in addition to its duties performed for some part of the time the labors of the chancellorship of the university also. In 1852 his health had become so completely broken that he was obliged to resign his connection with the university. In 1857 he removed to Poughkeepsie, where he still resides. Dr. Henry has published, beside the works above mentioned, "Compendium of Christian Antiquities" (8vo., 1837); "Moral and Philosophical Essays" (1839); "Guizot's General History of Civilization, with Notes;" "Household Liturgy;" Taylor's "Manual of Ancient and Modern History," revised, with a chapter on the history of the United States (8vo., New York, 1845); numerous addresses, &c.

HENRY, JOSEPH, an American physicist, born in Albany, N. Y., Dec. 17, 1797. He received a common school education, and for some years pursued the occupation of a watchmaker in his native city. In 1826 he was appointed professor of mathematics in the Al-

bany academy. A strong taste for scientific pursuits led him in 1827 to begin a series of experiments in electricity. In 1828 he published an account of various modifications of electro-magnetic apparatus. Previous to his investigations the means of developing magnetism in soft iron were imperfectly understood, and the electro-magnet which then existed was inapplicable to the lengthened transmission of power. He was the first to prove by actual experiment that in order to develop magnetic power at a distance, a galvanic battery of intensity must be employed to project the current through the long conductor, and that a magnet surrounded by many turns of one long wire must be used to receive this current. He was also the first actually to magnetize a piece of iron at a distance, and invented the first machine moved by the agency of electro-magnetism. (See ELECTRO-MAGNETISM.) In March, 1829, he exhibited to the Albany institute electro-magnets which possessed magnetic power superior to that of any before known, and subsequently he constructed others on the same plan, one of which, now in the cabinet of the college at Princeton, N. J., will sustain 3,600 pounds, with a battery occupying about a cubic foot of space. In 1831, in some experiments at the Albany academy, he transmitted signals by means of the electro-magnet through a wire more than a mile in length, causing a bell to sound at the further end of the wire. An account of these experiments and of his electro-magnetic machine was published in Silliman's "American Journal of Science" in 1831, vol. xix., in which Prof. Henry pointed out the applicability of the facts demonstrated by his experiments to the instantaneous conveyance of intelligence between distant points by means of a magnetic telegraph, which was several years subsequently brought into practical operation by Prof. Morse. In 1832 he was called to the chair of natural philosophy in the college of New Jersey at Princeton, where he continued his experiments and researches. In his first course of lectures in that institution in 1833 he mentioned the project of the electro-magnetic telegraph, and explained how the electro-magnet might be used to produce mechanical effects at a distance adequate to making signals of various kinds. He did not, however, attempt to reduce these principles to practice, or to apply any of his discoveries to processes in the arts. In Feb. 1837, he went to Europe, and in April of that year visited Prof. Wheatstone of King's college, London, to whom he explained his discoveries and his method of producing great mechanical effects at a distance, such as the ringing of church bells 100 miles off by means of the electro-magnet. In 1846, on the organization of the Smithsonian institution at Washington, Prof. Henry was appointed its secretary, a post which he still holds, and which gives him the principal direction of the institution. Prof. Henry has published "Contributions to Electricity and Magnetism" (4to., Phil-

adelphia, 1839), and is the author of many scientific papers in the "American Philosophical Transactions," in Silliman's "Journal," and in the "Journal of the Franklin Institute."

HENRY, PATRICK, an American orator and statesman, born at Studley, Hanover co., Va., May 29, 1736, died June 6, 1799. His father, John Henry, was a native of Aberdeen, Scotland, and nephew on the maternal side to Dr. William Robertson, the historian. His mother, whose maiden name was Sarah Winston, was first married to Col. John Syme of Hanover, and afterward to John Henry, who was colonel of a regiment, county surveyor, presiding magistrate, and a man of liberal education and conspicuous loyalty. The youthful Patrick Henry must have heard the king of England toasted many times at his father's board. A few years after the birth of the boy, Col. John Henry removed from Studley to Mount Brilliant in the same county, where the childhood and early youth of the future orator were passed. He was sent first to an "old field school," where at that period tuition was chiefly confined to the English and primary departments, with perhaps a smattering of the classics. At 10 years of age he returned home, and prosecuted his studies under the immediate care of his father, who had opened a grammar school in his own house. Here he acquired a competent English education, and some acquaintance with Latin and mathematics. But these pursuits encountered a powerful obstacle in other tastes of the boy, which are said to have strongly characterized his mother's family, the Winstons. Hunting and angling early grew to be passions with him. He would desert his books at any moment to seek the forest with his gun, or the neighboring streams with his fishing rod; and on these occasions he greatly preferred prosecuting his rambles alone. He would leave the noisy crowd who drove the deer, and take his silent stand at some spot where the animal probably would pass; or wandering away by himself, would lie lazily upon the bank, watching his cork for hours, in idle reverie. Thus, in a round of indolent dreams, passed some years, when at the age of 14 he accompanied his mother to church, and heard the celebrated Presbyterian preacher Samuel Davies. The incident was destined to produce a powerful effect upon the boy. The wonderful eloquence of Davies, which still lives in popular tradition, seems to have opened a new world for him. Henry spoke of him throughout life in terms of unbounded admiration, and declared that any success which he himself had achieved was due in large measure to the inspiring example of the great orator of the Presbyterian church. About this time his father's circumstances seem to have become embarrassed, and he required assistance from his sons. Patrick was accordingly placed behind the counter of a country merchant, and the year after, at the age of 16, his father set him up in business, with his elder brother William as partner. But the venture was unfortunate. The future orator possessed

• none of the traits which yield success in trade. He was indolent, careless, and as slovenly in his dress as he was awkward in manners. His conversation, it is true, was humorous and attractive, but his fondness for social pleasures was rather an obstacle than an advantage. William Henry was even less energetic than his brother, and, after a year's experience, abandoned the business. Instead of striving to supply the deficiency thus made, Patrick became still more indolent. His social and sporting propensities grew upon him. The hunter's horn and the cry of the hounds often drew him away; and even when he overcame the temptation, his occupations at the store were scarcely more profitable. He perseveringly expended on the violin and the flute the energies which should have been given to his business. At other times he gratified the spirit of dry humor which characterized him by exciting debates among the country people who hung around the store. He would relate stories, real or fictitious, and derive his own amusement from the emotions exhibited by the simple auditors. If to these idle pursuits be added the fact that he could not find it in his heart to refuse any one credit, the result of the mercantile venture may without difficulty be understood. At the end of 2 or 3 years the store was closed, and Patrick Henry was insolvent. He had just been married to Miss Shelton, the daughter of a respectable farmer. With the assistance of his father and father-in-law he commenced farming upon a small scale, but at the end of 2 years abandoned it in despair, and selling his scant property, turned again to merchandise. But experience and misfortune had taught him nothing. The violin, the flute, his old pastime of telling stories and watching the expression of his auditors, were cultivated with renewed ardor. He studied geography, read translations of Latin and Greek authors, Livy being his favorite, and, when weary of books, shut up his store, and went hunting or angling. The former result duly followed. He again became a bankrupt, and was compelled to cast about him for the means of supporting himself and his young wife. The law suggested itself, and, in that spirit of buoyant hopefulness which characterized him throughout life, he adopted the idea with ardor. At the age of 24, and after only 6 weeks' study, he presented himself before the judges, who granted him a license with serious hesitation, and only after procuring from the candidate a promise to study further before commencing the practice. It is said that at this time Henry was unable to draw a declaration, or perform the simplest duties of his profession. He could obtain no practice, and the distress of his family was extreme. He was living with Mr. Shelton, his father-in-law, who then kept the tavern at Hanover Court House, and assisted in a measure in the business, filling the place of Mr. Shelton in the tavern when he was compelled to be absent. Otherwise he was as idle as ever. Thus passed 2 or 3 years,

doubtless very miserable ones to the young man. His proud spirit must have writhed under the sense of dependence; and the pleasantries in which we are told that he indulged were probably the mask of an impatient and nervous discontent. But the moment approached which was to witness a change in his fortunes. Events were rapidly hastening toward the point when the great political struggle, in which he would bear so glorious a part, was to commence. His first appearance in public, as in every great movement of his career, was on the side of popular rights. At the age of 27 he was retained, for want of a better advocate, in what seemed a desperate struggle—the celebrated "parsons' cause," the history of which was briefly as follows. In 1755, a year of great drought, and serious public embarrassment from the expenses of the French war, the house of burgesses had enacted that all debts due in tobacco, then a species of currency, should be paid either in kind or in money, at the rate of 16s. 8d. for the 100 lbs. of tobacco, or 2d. per pound. The law was universal in its application, and was to remain in force for 10 months. Its effect was of course to reduce all fees and salaries to a moderate amount in money, and it bore especially upon the clergy of the established church. They were entitled by law to 16,000 lbs. of tobacco per annum each, and the act deprived them of about 66 per cent. of their due. There was much dissatisfaction, but no resistance. When, however, in 1758, a similar law was passed, an acrimonious controversy arose between the planters and the clergy. The latter appealed finally to the king in council, and the act was declared void. Suits were immediately instituted by the clergy in the different counties to recover the amount of loss which they had suffered by the "twopenny act." The county of Hanover was selected as the theatre of the struggle, the decision in one case being regarded as a fair test of the question. The court, on demurrer, very properly decided in favor of the plaintiff, the Rev. John Maury; and the case now stood upon a common writ of inquiry of damages. The contest was considered at an end, and Patrick Henry seems to have been employed by the defendants merely as a matter of form. They had calculated without the popular feeling against the clergy, who were sincerely hated by a great part of the people of the colony. A large crowd assembled to witness the trial of the question of damages. On the bench sat more than 20 of the clergy, among them many of the most learned men in the colony. Their case was lucidly and calmly stated by Mr. Peter Lyons, a distinguished counsellor of the time; and Patrick Henry rose to reply. The array before him was terrifying to a youthful and inexperienced man, and the presence of his father in the chair of the presiding magistrate did not lessen the embarrassment of his position. His exordium was awkward and confused. He visibly faltered. The crowd, whose sympathies were all on the side which he rep-

resented, hung their heads, and gave up the contest. The clergy smiled and exchanged glances of triumph. The father of the speaker almost sunk back in his seat. But a change suddenly took place in the demeanor of every one. All eyes were drawn to the youthful orator. His confusion had passed away; his form rose erect; his eyes surveyed the crowd with that eagle glance which is represented to have been one of his most striking traits; and the "mysterious and almost supernatural transformation of appearance," which his contemporaries spoke of, passed over him. Those who heard the unknown young man in this his first speech said that he "made their blood run cold and their hair to rise on end." Under his terrible invective the clergy disappeared hastily from the bench; and the jury, after retiring for an instant, brought in a verdict of one penny damages. A motion was made by Mr. Lyons for a new trial, but it was overruled; and Patrick Henry, thenceforth the "man of the people," was caught up by the crowd, drawn out of the court house, and borne on the shoulders of the delighted multitude. Thus, at a single step, Henry rose to the first rank among the orators of the time. His success in the parsons' cause brought him profit as well as fame. He no longer suffered from want of business, and seems to have addressed himself to the prosecution of his profession with industry and energy. The law was not, however, destined to monopolize his genius. He entered the house of burgesses in the spring of 1765, at the moment when England consummated her long series of oppressions upon the American colonies by the passage of the stamp act. The bill received the royal sanction in March of that year, and in May it came up for discussion before the burgesses. The character of that body was anomalous—its action difficult to predict. It had opposed consistently, and with stubborn fidelity, all encroachments of the home government from the earliest times; it had repeatedly denied the right of the English parliament to lay imposts upon the people of the American colonies, and had systematically contended for the great constitutional principle that taxation and representation were inseparable. But peculiar elements and considerations entered into the struggle about to take place. An open rupture with England was extremely repugnant to the rooted sentiments and long cherished prejudices of the dominant party in the house. The great majority of the burgesses were opulent planters of the tide water region. They were attached to the mother country by a thousand ties. Proud of their origin and of the greatness of the English name, every consideration of kindred blood, family memories, and social alliance with the gentry of England, led them to revolt from a definite termination of the close and grateful connection. They regarded Magna Charta, the established church, and the common law, as a part of their inheritance; and a dissolution of the ties which bound

them to Great Britain seemed a relinquishment of the part which they had in these great institutions. Thus socially and politically the ruling classes in Virginia were opposed to extreme measures, and in the house which assembled in the spring of 1765 they were represented by their most powerful names. These gentlemen tried to convince themselves that the crisis was not as dangerous as it was described to be. They would not agree that the plain choice was between submission and resistance. They held back, hesitated, and advocated renewed protests and petitions. It was in the midst of this general indecision and doubt that Patrick Henry startled the assembly, and threw them into sudden agitation, by his celebrated resolutions. He was almost unknown to the members, and the first sentiment of the richly clad planters was scorn and indignation at the presumption of the slovenly and awkward youth, in leather knee breeches and a homespun coat, who ventured thus to assume the post of leader in an assemblage so august and at a moment so critical. The prejudices of caste were thus added to bitter political opposition, and the struggle between the obscure youth and his powerful adversaries began with passionate vehemence. His resolutions, which he had hastily written on the leaf of a law book, contained none of the old formal and submissive phrases. They suggested no new petition or protest. They declared that the house of burgesses and the executive had "the exclusive right and power to lay taxes and imposts upon the inhabitants of this colony;" and that, consequently, the stamp act, and all other acts of parliament affecting the rights of the American colonies, were unconstitutional and void. It will be easily understood that these resolves startled from their propriety, and stung into sudden and bitter activity, the advocates of new petitions, memorials, and representations. Their hostility was violent, and young Henry was the mark at which they directed their most indignant invectives. The best patriots received the resolutions with a tempest of opposition. They were declared extreme, impolitic, and dangerous. "Many threats were uttered," says Henry, "and much abuse cast on me by the parties for submission." Thomas Jefferson, who heard the debate, says that it was "most bloody." But the nerve and resolution of the young burgess were as great as his eloquence. In the midst of the debate he thundered: "Cæsar had his Brutus, Charles the First his Cromwell, and George the Third—" "Treason!" cried the speaker, "Treason, treason!" echoed from every part of the house—"may profit by their example! If this be treason, make the most of it!" The resolutions, in spite of a bitter and determined attack, were carried—the last by a majority of one. The passionate opposition of the conservative party sufficiently appears from an incident related by Jefferson. As Mr. Peyton Randolph, one of the burgesses, passed him in the lobby, he exclaimed with a violent oath:

"I would have given 500 guineas for a single vote!" The young man had thus achieved at the age of 29 the reputation of being the greatest orator and political thinker of a land filled with celebrated public speakers and statesmen. His voice had aroused the storm; his genius had comprehended the exigencies of the crisis, and set the ball in motion. He had suddenly become a "power in the state;" and the sceptre, departing from the hands of the wealthy planters, was wielded by the county court lawyer. The mouthpiece of resistance, the authoritative representative of the masses as distinguished from the aristocracy, and soon to be the advocate of revolution, Patrick Henry thenceforth occupied a post of strength from which his most powerful enemies were unable to drive him. From the pursuits of his profession, to which he returned, he was soon again recalled to the stage of public events. The stamp act had been repealed, but the policy of laying burdens upon the colonies had not been abandoned. In 1767 the act levying duties upon tea, glass, paper, and other articles, threw the country into renewed ferment. To curb the malcontents of the northern provinces, two British regiments and some vessels of war were sent to Boston. Events ripened slowly but surely. In the spring session of 1769 the leading advocates of resistance in the house of burgesses, of whom Patrick Henry, Thomas Jefferson, and the Lees were the most active and determined, offered a series of resolutions which caused the dissolution of the body by Lord Botetourt. Henry and his friends immediately assembled at the old Raleigh tavern in Williamsburg, and drew up articles of association against the use of British merchandise, which were generally signed by the burgesses. Here terminated for a time the struggle, and Henry returned to his profession, though he continued a member of the burgesses. In this year he was admitted to the bar of the general court, where his appearance was respectable, but not distinguished. He was not a good "case lawyer," from defective study; but in jury trials, where his wonderful powers of oratory could be brought to bear upon the passions of men, he far exceeded all his contemporaries. The effect which he produced upon juries is said to have been almost indescribable. He exercised a species of magnetic fascination over them, which took their reason captive and decided the result without reference to the merits of the case. For 4 years Henry continued to occupy a seat in the house of burgesses, and to practise his profession. Then the struggle between Great Britain and the colonies commenced in earnest. It was plain that both sides were greatly embittered, and there is every reason to believe that Patrick Henry, Thomas Jefferson, and other advocates of uncompromising resistance, desired to take advantage of the public sentiment, and precipitate the rupture. Early in the session of 1773, Henry, Jefferson, the two Lees, and Dabney Carr met in the Ra-

leigh tavern and originated that great machine, the "committee of correspondence, for the dissemination of intelligence between the colonies." The burgesses promptly acted upon the suggestion, and were as promptly dissolved by Lord Dunmore, who had succeeded Botetourt. They were, every one, reelected by the people, and resumed their seats in the spring of 1774. The committee of correspondence had been duly organized, and "the plan thus proposed," says Mr. Irving, "by their 'noble, patriotic sister colony of Virginia,' was promptly adopted by the people of Massachusetts, and soon met with general concurrence." Massachusetts had already made her courageous stand against parliament. The tea of the East India company had been thrown overboard in Boston harbor, and a collision between England and the colonies was now in the highest degree probable. The most determined patriots were therefore summoned to the public councils in Virginia. The Boston port bill, closing Boston harbor on June 1, speedily arrived. The leaders of the burgesses again met in secret consultation, and the result was a resolution that the 1st of June should be set apart as "a day of fasting, humiliation, and prayer" throughout the province. The burgesses passed the resolution, and Dunmore duly dissolved them. They retired to the Raleigh tavern as before; but public feeling was too deeply aroused to content itself with protests or "articles of association." The day of petitions and memorials had passed away; the time for definite action had arrived. The meeting at the Raleigh in May, 1774, resulted in two resolves of the utmost importance. The first was that the different counties should be recommended to elect deputies to assemble at Williamsburg, Aug. 1, to consult for the good of the colony. The second was that the committee of correspondence should propose immediately to all the colonies a general congress, to meet annually, and deliberate upon the common welfare; "the first recommendation of a general congress," says Mr. Irving, "by any public assembly." The deputies accordingly assembled on Aug. 1, subscribed a new and more thorough non-importation agreement, and appointed delegates to a general congress, to meet at Philadelphia in September. Among these delegates was Patrick Henry, and his voice was the first to break the silence of the august assembly. His fame had preceded him. He was recognized and greeted as the great champion of constitutional liberty—the man who, more than any other, had aroused public sentiment in, and directed the councils of, the great province of Virginia. His extraordinary eloquence astonished all listeners. It was "Shakespeare and Garrick combined." When he took his seat, there was no longer a doubt in any mind that he was the greatest orator of America, and one of the greatest of any land or age. In the routine of actual business Henry was surpassed by many of his associates. Here, as throughout life, his constitutional indolence

interposed. But it may justly be doubted whether, by confining the exercise of his genius to vital principles and great occasions, he did not achieve more splendid results for his country. A petition to the king, and an address and memorial to the inhabitants of Great Britain, were the chief results of the congress, which adjourned in October. Henry returned home with his brother delegates, and, when asked who was "the greatest man in congress," replied that Mr. Rutledge of South Carolina was the greatest orator, but Col. George Washington the greatest man—an instance of his powers of penetrating into the depths of human character. With the spring of the next year, 1775, all things advanced rapidly toward the dividing line between peace and war. In March the second convention met at old St. John's church in Richmond, and here again Henry assumed a position very far in advance of his associates. He rose and moved that the militia should be organized, and the "colony be immediately put in a state of defence." The resolutions met with strong opposition, as had been the case with his stamp act resolutions 10 years before in the house of burgesses. The leading and greatest patriots warmly opposed them as precipitate and ill advised. Henry's speech in reply was one of extraordinary eloquence and power. With the vision of a prophet almost, he exclaimed: "There is no retreat but in submission and slavery. Our chains are forged! Their clanking may be heard on the plains of Boston. The next breeze that sweeps from the north will bring to our ears the clash of resounding arms. . . . I know not what course others may take; but as for me—give me liberty or give me death!" The resolutions were passed without a dissenting voice, and the convention rose. Ere long arrived the news of the battles of Lexington and Concord. The contest was not to be long delayed on the soil of Virginia. In compliance with general orders from England, Lord Dunmore on the night of April 20 removed clandestinely from the magazine in Williamsburg all the powder of the colony. The alarm spread rapidly throughout the province, and the people flew to arms. Seven hundred men assembled at Fredericksburg, but, receiving an assurance that the powder would be restored, were disbanded. Patrick Henry saw the favorable moment thus about to pass. He determined to act boldly. Summoning the militia of Hanover, he placed himself at their head, despatched a troop to arrest the king's receiver-general, and marched upon Williamsburg. Lord Dunmore's agent met him on the way, and paid £330 for the powder; and on his return home, Henry found himself and his friends denounced in a public proclamation as "deluded" rousers of sedition. But the whole province, indeed all the land, was equally deluded. The defiance had been given by Henry; the authority of the king, in the person of his representative, menaced with an armed force. There was no

choice thenceforth but between submission and open resistance. In June, Lord Dunmore fled with his family from Williamsburg on board the *Fowey* man-of-war, and in July a convention met at Richmond which organized a committee of safety, consisting of 11 gentlemen, endowed with almost dictatorial powers. Two regiments were directed to be immediately raised, and Patrick Henry was elected colonel of the first and commander of all forces to be enrolled; William Woodford, colonel of the second. Lord Dunmore at this time was ravaging the shores of the Chesapeake and threatening Norfolk, and the committee of safety were compelled to act promptly. They detached Col. Woodford at the head of the greater portion of the forces against the enemy, and the result was the battle of Great Bridge, in which the raw Virginia recruits drove back the best trained English grenadiers and gained a victory, sending Dunmore back to his ships. The action of the committee in passing over Henry was however violently inveighed against by his friends, and the venerable Edmund Pendleton, the president, was especially assailed. The censure seems to have been wholly unjust. The right of the committee to assign a separate command to Col. Woodford was formally stated in Henry's commission, and Woodford's military experience determined the action of the committee in selecting him for this critical undertaking. The ardent feelings of Henry and his disappointment doubtless betrayed him into resigning his commission, which he speedily did, though between Pendleton and himself there was never any quarrel. He was a delegate to the convention which met in May, 1776, and instructed the Virginia deputies to the general congress to propose to that body to "declare the united colonies free and independent states." In the same year he was elected the first republican governor of Virginia, by a majority of 15 over his competitor Thomas Nelson. From this time Henry's career was rather that of the statesman and minister of public affairs, than the ardent, imposing, almost dazzling orator of revolution. From the forum he passed to the closet, with equal advantage to his country. He filled the office of governor by successive reelections until 1779, when he was no longer eligible. During this trying period he was eminently serviceable in sustaining public spirit and seconding the efforts of the great leaders of the revolution. He returned to the legislative body, where he served throughout the war, at the termination of which he was again elected governor, and served until the autumn of 1786, when he resigned. In 1788 he was a member of the convention to ratify the federal constitution, an instrument against whose adoption the aged statesman fought with all the strength and eloquence of his youth. Although this opposition afterward abated in a measure, he remained fearful to the end of his life that the final result would be the destruction of the rights of the sovereign states. In 1794 he re-

tired from the bar, and removed to his estate of Red Hill in Charlotte. In 1795 Washington appointed him secretary of state, in place of Edmund Randolph, who had resigned; but Henry declined the appointment, as he did that of envoy to France afterward offered him by Mr. Adams, and that of governor offered him in 1796. In March, 1799, yielding to the request of Washington and other distinguished persons, and desirous of doing his part to avert what he feared would be the disastrous results of the "resolutions of '98" just passed by the Virginia house, he ran for the state senate in his district—John Randolph of Roanoke making his first public appearance on the same occasion, in support of the policy of the resolutions, but not as Henry's opponent. The great orator had only to indicate his wishes to fill any public position, and was easily elected. But he never took his seat. The speech at Charlotte Court House was his last, and it is said to have been worthy of his fame. As he descended from the rostrum, feeble but thrilling with the spirit of the encounter, a bystander said: "The sun has set in all his glory." He died within less than 3 months afterward.—Patrick Henry was undoubtedly one of the most extraordinary men of an extraordinary epoch. He appeared upon the theatre of events with the unflinching and majestic port of the chosen agent of Providence, moulded and severely trained for his peculiar mission. The country was filled with men of great and conspicuous ability—with orators, statesmen, and political thinkers of the first order of excellence; but in this assemblage of imposing figures the untaught youth of the "Hanover slashes" towered head and shoulders above the tallest. In the house of burgesses he bore away the palm from Edmund Pendleton, Richard Henry Lee, George Mason, and the most powerful men of the time. In the general congress, the men of Massachusetts and the North, as magnanimous as they were great in intellectual strength, acknowledged that Henry was the grandest orator whom they had ever heard. Of this conspicuous endowment there are a thousand proofs, countless anecdotes and traditions. The accounts seem so much hyperbole; but in this apparent extravagance all agree without exception; and it is established beyond a rational doubt, that Henry possessed a natural genius for moving men such as has rarely been bestowed upon humanity. It was long a popular saying, to describe the desperate plight of a criminal, that "Patrick Henry couldn't save him;" and when the country folk desired to give a speaker their highest praise, they compared him to "Patrick Henry when he plead against the parsons." Jefferson said that he seemed to him to speak "as Homer wrote;" and one who heard him in a great debate, when he wore a diamond ring, exclaimed unconsciously: "That diamond is blazing!" Undoubtedly a large part of his wonderful success, against such fearful odds as he encountered in the commencement of his career, was due to his moral

courage. To that mysterious eloquence which swayed and took captive all minds, he united a nerve and resolution, which when thoroughly aroused were wholly indomitable. There was a hard stubborn fibre in his moral organization which resisted all attacks, and defied whatever attempted to move him. At such moments nothing could make him shrink. The cries of "Treason! treason!" when in 1765 he spoke for the first time in the house of burgesses, only made him more stubbornly bent on carrying his proposition, and provoked, instead of terror and submission, an open and haughty defiance. Whenever he was thus aroused from the depths of his nature, his immense passion, united to an intellectual strength as powerful, carried him onward over all opposition. He seemed to silence the strongest—to annihilate his opponents as by a spell. In 1775 he again stood up alone, against the whole body of his associates. His policy was greeted with a storm of opposition—and unanimously adopted. Driven as it were, without the power of resistance, the convention decreed that the militia should be organized, the gauntlet thrown down. It is not singular that a will so iron-like, aided by an eloquence so extraordinary, should have overwhelmed all opposition, vigorous and weighty as that opposition was. As a mere logician, apart from the advocate, Henry was not of conspicuous talents; though it must be conceded that in politics he was an original thinker, almost a seer. He was not a great lawyer, and his name remains connected with no large measures of policy under the new order of things, like that of Jefferson. He lives and will always live as the mouthpiece of the revolution, the voice which uttered most boldly and clearly the eternal principles of human freedom. The child of nature, untaught in colleges, and moved as it were unconsciously by some mysterious inner impulse, his eloquence was right reason clothed in a natural and unforced passion which made every human bosom thrill, as at the touch of the master mind. He was a man of the revolution, the representative of a convulsed epoch and an indignant people; the words which he uttered were those which trembled upon the lips of millions. Viewed in this light alone—as the orator of revolution, the representative of the spirit of the age in which he lived—he occupies perhaps a loftier and more striking position than any other actor in the struggle for American liberty. In person this celebrated man was rather striking than prepossessing. Nearly 6 feet high, spare, raw-boned, and slightly stooping in the shoulders, he gave no indication of the majesty and grace which characterized his appearance when his genius was aroused. His complexion was sallow; his countenance grave, thoughtful, stern in repose, and marked with the lines of deep and painful reflection. His brows were habitually contracted, and communicated to his features an air of forbidding sternness and severity. The mouth, with closely compressed lips,

and deep furrows at the corners, was set in an expression of unyielding resolution. When he spoke, however, a wonderful change passed over him. His person rose erect, his head, instead of stooping, was held proudly aloft, and the whole man seemed to undergo a transformation. The power which he possessed of expressing feeling by a simple movement of feature was extraordinary. The stern face would relax and grow soft, pensive, and gentle; or a withering rage would burn in the fiery eyes; or eyes, mouth, and voice would convey to the listener emotions of the tenderest pathos. In private life he was kindly, good-humored, and agreeable. He possessed a dry humor which was very attractive. He indulged in none of the vices of high living then prevalent; temperate, frugal, rarely drinking any thing but water, he presented a strong contrast to his contemporaries. His reading was not extensive, but serious and solid. Livy was his favorite historian; but his reading was chiefly confined to the Bible. He was a devout Christian, and when governor had printed and circulated at his own expense Soame Jenyns's "View of Christianity," and Butler's "Analogy." Sherlock's sermons he read every Sunday evening to his family, after which all joined in sacred music, while he accompanied them upon the violin. All the accounts of his personal bearing represent it as simple, plain, and cordial. There was an honest good feeling in his manner which induced the commonest persons to approach him with confidence. By this class he was almost idolized; and throughout his whole career he retained their unbounded admiration, attachment, and respect. Indeed, it is as the "tribune of the people" that Henry's name will descend to the remotest posterity. It was always as the representative of the masses that he presented himself. He never desired to be other than this. "Stick to the people, old fellow," said a rough neighbor; "if you take the back track, we are gone." He never took the back track. He was raised among the plain, brave, honest class whom he represented, and never wished to desert them. As in his fiery youth there was something chivalric and nobly honest, so in his old age there was a patriarchal simplicity and absence of every thing which detracted from the majestic proportions. Having performed the great mission for which Providence designed him, he disappeared at nearly the same moment with his friend George Washington, leaving his fame where it will be safe, with the people of America.—The life of Patrick Henry has been written by William Wirt (8vo., 1817), and by A. H. Everett, in Sparks's "American Biography."

HENRY, PHILIP, an English nonconformist divine, born in Whitehall, London, Aug. 24, 1631, died June 24, 1696. He was educated at Westminster school and at Christchurch, Oxford, was ordained to the ministry at Worthenbury, Flintshire, in 1657, was one of the 2,000 clergymen who left the church of England in

1662 in consequence of the act of uniformity, and lived in seclusion till in 1687 he was permitted again to preach by the declaration of King James in favor of liberty of conscience. From that time he held public religious services near his residence at Broad Oak, which were attended by throngs from distant places, and also preached frequently in various parts of the country. Many of his sermons and expositions have been published since his death. His biography, by his son Matthew Henry (London, 1698), has passed through many editions.—MATTHEW, an English biblical commentator and nonconformist divine, son of the preceding, born at Broad Oak, Flintshire, Oct. 18, 1662, died in Nantwich, June 22, 1714. From childhood he was remarkable for the activity of his mind. He could read the Bible in his 3d year, and the Greek Testament in his 9th. In 1685 he entered Gray's Inn as a student of law, though without any view to pursuing the legal profession, his inclination being for the ministry. His first efforts at public preaching were received with the highest favor, and he was soon invited to Chester, where, being ordained in 1687, he drew around him a large congregation, to which he ministered for 25 years. During this period he more than once went through the entire Bible in a course of expository lectures, which he continued at Hackney, whither he removed in 1712. He thus gradually completed his celebrated "Exposition" of the Bible, a large portion of which was uttered in his public lectures, while many of the quaint and striking sayings and pithy remarks which give such a charm to its pages were the familiar extempore observations of his father at family worship, noted down by Matthew in his boyhood. The first collective edition was published in 1710 (5 vols. fol., London), and it has been many times reprinted. Mr. Henry's other works include "Life and Death of Rev. Philip Henry" (8vo., 1698); "Method of Prayer" (8vo., 1710); "Treatise on Baptism;" "Communicant's Companion" (12mo., 1731). A collection of his miscellaneous works, in 1 vol. 8vo., appeared in London in 1830.

HENRY, ROBERT, LL.D., president of the college of South Carolina, born in Charleston, S. C., Dec. 6, 1792, died in Columbia, Feb. 6, 1856. He was educated in the vicinity of London and at the university of Edinburgh, where he was graduated in 1814. He chose the ministry as his profession, and after a short residence on the continent returned to Charleston, and became pastor there of the French Protestant church, preaching alternately in French and English. In 1818 he was elected professor of logic and moral philosophy in the South Carolina college; in 1824 the department of metaphysics was assigned him, to which that of belles-lettres was subsequently joined; in 1833 he became president *pro tempore*, and in 1842 was unanimously elected permanent president of the college. He resigned this office in 1845, and from that time held the professorship of the Greek language and literature. He was

one of the ablest contributors to the "Southern Review;" among his articles were reviews of Niebuhr's "Roman History," La Motte Fouqué, and Goethe's "Wilhelm Meister." He also published several sermons and eulogies.

HENRY, ROBERT, a Scottish divine and historian, born in the parish of St. Ninian's, Stirlingshire, Feb. 18, 1718, died near Edinburgh, Nov. 24, 1790. He was educated at the university of Edinburgh, and was afterward master of the grammar school of Annan till in 1746 he was licensed as a preacher. He was pastor of a Presbyterian congregation at Carlisle from 1748 to 1760, at Berwick-upon-Tweed from 1760 to 1763, and afterward in Edinburgh. His principal work is a "History of Great Britain" (6 vols., Edinburgh and London, 1771-'93), written on a new plan, in accordance with which each period occupied a volume, and each volume was divided into 7 chapters, which treated separately and successively the civil and military transactions, the ecclesiastical affairs, the history of the constitution and laws, the state of learning and literature, the state of arts and manufactures, the history of commerce, and the history of manners and customs. It extended to the death of Henry VIII., and was continued to the accession of James I. by J. P. Andrews (London, 1794). The earlier volumes of Dr. Henry's history were assailed with malignity pertinacity by Gilbert Stuart, the terror of the Scottish literati of that time, whom he seems to have indiscriminately detested and despised. He projected in 1773 the "Edinburgh Magazine and Review," which made Dr. Henry a special object of satire. When this failed, he passed to London and conducted with ruthless skill and pertinacity a conspiracy to stop the sale of Dr. Henry's work, to cover him with obloquy and ridicule, and, as was charged, to break his heart. "To-morrow morning," he writes in a letter, "Henry sets off for London with immense hopes of selling his history. . . . I wish sincerely that I could enter Holborn the same hour with him. He should have a repeated fire to combat with. I entreat that you may be so kind as to let him feel some of your thunder. I shall never forget the favor. If Whitaker is in London, he could give a blow. Paterson will give him a knock. Strike by all means." From almost every quarter Dr. Henry encountered the ingenious opposition of his enemy, which was acutely directed against the real failings of his work, and was for a time successful in stopping its sale. An account of this persecution is given by Disraeli in his "Calamities of Authors."

HENRY, WILLIAM, an English chemist, born in Manchester, Dec. 12, 1775, died Sept. 2, 1836. He studied under Dr. Black of Edinburgh. Though he practised in Manchester as a physician, he gave his particular attention to chemistry, the results of his researches being published in the "Philosophical Transactions" of the royal society. He made many elaborate experiments with muriatic acid gas, and published

his conclusions in 1800. In 1803 he published his experiments on the quantity of gases absorbed by water at different temperatures, and he established the law "that water takes up of gas condensed by one, two, or more additional atmospheres, a quantity which would be equal to twice, thrice, &c., the volume absorbed under the common pressure of the atmosphere." He is the author of a work entitled "Elements of Chemistry" (London, 1823), which has gone through 10 editions.

HENRY THE NAVIGATOR, a Portuguese prince, born in Oporto, March 13, 1394, died at Sagres, Nov. 13, 1463. He was the 3d son of King John I. of Portugal and Philippa, daughter of John of Gaunt, duke of Lancaster. While still a youth he displayed his courage in war with the Moors of Barbary, and was knighted for his bravery in the expedition which achieved the conquest of Ceuta in 1415. On his return from this expedition he fixed his residence at Sagres in Algarve, near Cape St. Vincent, and occupied himself with sending out vessels to cruise against the Moors and to harass the coast of Africa, where he made himself three campaigns. He was, however, impelled by higher motives than those of the mere soldier. He was distinguished for learning, particularly for mathematical and geographical knowledge. He founded at Sagres an observatory and a school where young noblemen were instructed in the sciences connected with navigation. He delighted to converse with scholars, and especially with those who had made voyages to remote regions, and during his campaigns in Morocco spared no pains to acquire from the natives all the knowledge they possessed of the interior of Africa and of its southern coasts. The first use of the compass in European navigation, and in part the invention of the astrolabe, are ascribed to him. His studies and inquiries led him to the conclusion that the coast of Africa did not end, as was then commonly supposed, at Cape Nam, or Non, but that great and valuable discoveries might be made by tracing its line to the southward into the unknown and dreaded torrid zone. The first expedition he sent for this purpose consisted of two vessels commanded by Jobam Gonçalves Zarco and Tristram Vaz, who set out to pass Cape Nam, but were driven off the coast by storms, and accidentally discovered the little island of Porto Santo near Madeira. In the next year (1419) the same captains discovered and subsequently colonized Madeira. Prince Henry during the next 12 years sent vessel after vessel down the coast of Africa, some of which succeeded in passing Cape Nam and reaching Cape Bojador, 200 miles further to the south. But that cape, from the failure of repeated attempts to double it, was now popularly considered the limit of the habitable world, and there began to be much complaint in Portugal at the expense and hazard of these fruitless expeditions, which were looked upon in that day very much in the light in which expeditions to the arctic regions are regarded in

the 19th century. The prince, however, persevered, and at length Gil Eannes, whom he sent out in 1433, succeeded in passing Cape Bojador, an achievement that created great excitement at the time, and which forms an era in the history of maritime discovery. From 1434 to 1441 Prince Henry was chiefly occupied with the domestic affairs of Portugal, which were involved in much confusion. In 1437 he took part in the disastrous expedition against Tangier, in which his brother Ferdinand was taken prisoner by the Moors, who kept him in captivity till his death. In 1441 the pope, at the request of Prince Henry, granted to the Portuguese crown all that it could conquer from Cape Bojador to the Indies. The discoveries of the Portuguese had by this time been pushed down the coast to the mouth of a river nearly 200 miles south of Cape Bojador. In 1445 the prince sent a vessel under command of Dinis Dyaz or Dinis Fernandez, who boldly pushed down the coast till he reached Cape Verd—the longest advance at one effort that had yet been made in African navigation. By this time the popular feeling had changed with regard to these voyages, many of which brought not only honor and fame but profitable returns in gold and slaves, and numbers of enterprising men were ready to engage in them. In 1447 a fleet of 14 vessels was fitted out at Lagos, and the command given by Prince Henry to Lançarote, and sent to the African coast, without however any greater result than extending the limit of discovery to the river Gambia. Several other expeditions in the same direction were subsequently sent out by the Portuguese government under the advice and control of Prince Henry, one of which just before his death succeeded in reaching Sierra Leone. The Portuguese historian Faria y Sousa, in his *Asia Portuguesa* (Lisbon, 1666), thus sums up the character of Prince Henry: "He had a grandeur of nature proportionate to the greatness of his doings; he was bulky and strong; his complexion red and white; his hair coarse and shaggy. His aspect produced fear in those who were not accustomed to him; not in those who were, for, even in the strongest current of his vexation at any thing, his courtesy always prevailed over his anger. He had a grave serenity in his movements, a notable constancy and circumspection in his words, modesty in all that related to his state and personal observance within the limits of his high fortune. He was patient in labor, bold and valorous in war, versed in arts and letters; a skilful fencer; in the mathematics superior to all men of his time; generous in the extreme, and zealous in the extreme for the increase of the faith. No bad habit was known in him. He did not marry, nor was it known that he ever violated the purity of continency."

HENRYSON, ROBERT, a Scottish poet of the 15th century. Of the particulars of his life and the time of his death little or nothing is known. Dunbar, in his "Lament," printed in 1508, speaks of "gude Mr. Robert Henryson" as

among the departed poets. He seems to have been chief schoolmaster at Dunfermline, and was not unlikely an ecclesiastic, and perhaps a Benedictine monk. One account identifies him with Henryson of Fordell, father of James Henryson, who perished in the battle of Flodden. His principal work is his collection of "Fables," 13 in number, which was edited by Dr. Irving in 1832. Among his other writings are the tale of "Orpheus Kyng, and how he geid to Hewyn and Hel to seik his Quene" (Edinburgh, 1508); "Testament of Cresseid" (1593), a poem which was suggested by and was a sequel to Chaucer's "Troilus and Cresseid," in connection with which it generally appears; "Robin and Makynne," printed in Percy's "Reliques;" and several smaller poems, which have been printed in different works.

HENSHAW, JOHN PRENTISS KEWLEY, D.D., bishop of the Protestant Episcopal church in Rhode Island, born in Middletown, Conn., June 13, 1792, died July 20, 1852. He was graduated at Middlebury college, Vt., in 1808. His early religious education had been that of a Congregationalist; but while on a visit to his native place in Connecticut, he received baptism in the Episcopal church. On returning to Vermont, Bishop Griswold appointed him lay reader in Middlebury and vicinity, and through his zealous labors several congregations were established in different parts of the state. Anxious to prepare himself thoroughly for the ministry, he removed to Bristol, R. I., where Bishop Griswold resided, and pursued his studies under the bishop's direction. In June, 1813, he was admitted to deacon's orders. Directly afterward he removed to St. Anne's church, Brooklyn, N. Y., where in 1816 he was admitted to the priesthood. In the spring of 1817 he accepted a call to St. Peter's church, Baltimore, Md. The convention of Rhode Island made choice of him for their bishop, and he was consecrated in St. John's church, Providence, Aug. 11, 1843. On removing to his diocese, he became also rector of Grace church, Providence. In 1852 he was requested to perform episcopal services in Maryland, during Bishop Whittingham's absence. He proceeded to Baltimore, engaged actively in the various duties devolving upon him, and exerted his strength beyond what was prudent. On Sunday, July 18, he rode 20 miles and performed full services; the next day he rode 18 miles to another church, and was very much exhausted, but refused to spare himself. Lodging for the night near Frederic, the next morning at daybreak he was stricken with apoplexy, and about 1 P. M. he expired. He was the author of a treatise "On Confirmation," a "Selection of Hymns," "Lectures on the Advent," and "Theology for the People of Baltimore" (Svo., 1840).

HENTZ, CAROLINE LEE, an American authoress, born in Lancaster, Mass., died in Marianna, Fla., Feb. 11, 1856. She was the daughter of Gen. John Whiting, and was married in 1825 to Mr. N. M. Hentz, who was afterward ap-

pointed professor at Chapel Hill college, N. C. At Covington, Ky., whither they removed from Chapel Hill, she wrote "De Lara, or the Moorish Bride," a play which obtained a prize of \$500, and was performed in Philadelphia. She lived successively in Cincinnati, O., Florence, Ala., Tuscaloosa, Tuskegee, and Columbus, Ga. Her writings were chiefly fugitive pieces of poetry and novels, most of which were first printed in newspapers and magazines. Among them are: "Aunt Patty's Scrap Book" (1846); "The Mob Cap" (1848); "Linda, or the Young Pilot of the Belle Creole" (1850); "Rena, or the Snowbird" (1851); "Marcus Marland, or the Long Moss Spring" (1852); "Eoline, or Magnolia Vale" (1852); "Wild Jack" (1853); "Helen and Arthur, or Miss Thusa's Spinning Wheel" (1853); "The Planter's Northern Bride" (1854); "Ernest Linwood" (1856).

HEPHÆSTION, a Macedonian, who was the friend and companion of Alexander the Great, with whom, according to Curtius, he had been brought up. When, at the commencement of his Asiatic expedition, Alexander visited Troy, Hephæstion accompanied him. He was endeared to his master rather by his social virtues than by political or military abilities. He was, however, frequently intrusted with commands of great importance, and for his services on these occasions he was rewarded with a golden crown on his arrival at Susa, and received in marriage Drypetis, the daughter of Darius, and sister of Statira. From Susa he accompanied Alexander to Ecbatana, where he was seized with a fever which carried him off after an illness of 7 days (324 B. C.). Alexander's grief for the loss of his friend was extravagant. His body was transported to Babylon, where a magnificent pyre and monument were erected to him; and orders were issued that a general mourning should be observed throughout the empire, and that divine honors should be paid to the deceased hero.

HEPHÆSTUS. See VULCAN.

HEPTARCHY (Gr. *ἑπτα*, seven, and *αρχη*, rule), a general term applied to the 7 distinct kingdoms which the Saxons formed in England. These were Kent, Sussex, Wessex, Essex, Northumbria, East Anglia, and Mercia. The heptarchy terminated about 828, when Egbert became king of all England.

HERA. See JUXO.

HERACLEA, the name of several ancient Greek cities, the most important of which were: I. A city of Magna Græcia, in Lucania, near the Tarentine gulf, founded by a colony of Thuriens and Tarentines in the 5th century B. C. II. A city of Sicily, at the mouth of the Halycus, between Agrigentum and Selinus. It was surnamed Minoa, because Minos, the celebrated Cretan lawgiver, was supposed to have been one of its founders. III. A city of Bithynia, surnamed Pontica (the modern *Eregli*), founded by a colony of Megarians and Boeotians, on the S. shore of the Euxine. Its ruin was consummated by the Bithynians and Romans.

HERACLIDÆ, a patronymic which in a general sense means all Hellenic families descended from Heracles (Hercules); but in a more limited sense, those of his descendants who, in conjunction with the Dorians, invaded and conquered Peloponnesus about the middle of the 11th century B. C.

HERACLITUS, a Greek philosopher who flourished probably in the 6th century B. C. He was a native of Ephesus, and from his gloomy disposition was styled the "weeping philosopher." In his youth he travelled extensively, and on his return to Ephesus was offered the chief magistracy of the city, but declined the honor because of the bad morals of the Ephesians, and employed himself in playing at dice near the temple of Diana, declaring even that to be a more profitable occupation than attempting to govern his fellow citizens. Afterward he became a confirmed recluse, retiring for a time to the mountains, and living altogether on herbs. His philosophical creed was embodied in a work commonly entitled *Περὶ Φύσεως*, "On Nature." The most remarkable tenets of this creed were that, by the operation of a light ethereal fluid, which he denominated fire, all things in the universe, animate and inanimate, material and immaterial, were created, and that acquiescence in the decrees of the supreme law was the great duty of man. His style was so obscure and so difficult to be understood, that the Greeks surnamed him "the unintelligible." He was regarded in antiquity as the antipodes of Democritus, the "laughing philosopher." The fragments of his treatise were published by Schleiermacher in Wolf and Buttmann's *Museum der Alterthumswissenschaft*.

HERACLIUS, a Roman emperor of the East, born in Cappadocia about A. D. 575, died March 11, 641. He was the son of Heraclius, exarch of Africa, and first appeared in a public capacity in 610, when his father sent him with a fleet to besiege Constantinople, and dethrone the tyrant Phocas. This enterprise he accomplished, and was himself chosen to fill the vacant throne. At the accession of Heraclius, the empire was in a deplorable condition. The barbarians of the north were laying waste its European provinces, while the Persians, under their king Chosroes II., were overrunning and ravaging those of the east. The first object of the new emperor was to protect his European dominions and to make provision for their future security. The king of the Avars having withdrawn from before Constantinople, after treacherously slaying or taking captive immense numbers of citizens who had come out to witness an interview between him and Heraclius, the latter allotted that part of Illyricum bordering on the Adriatic and the Danube, which had been depopulated, to the Servians and Croats, in order that they might serve as a barrier to his N. W. frontier. Then, turning his attention eastward, as soon as he considered his army sufficiently disciplined to take the field, he placed himself at its head, and sailing from the Bosphorus in

622, landed in Cilicia, and encamped on the plain of Issus, where he defeated a mighty force of Persians. From Cilicia he fought his way into Pontus, and afterward returned to Constantinople, while his soldiers went into winter quarters. In the following spring he landed at Trebizond with another army, whence, marching through the regions of the Caucasus, he penetrated into Media, forming alliances and destroying the temples of the Magi as he proceeded. This campaign was closed by a second brilliant victory over the Persians commanded by Chosroes in person. In 625 he invaded Mesopotamia, and returning through Cilicia, gained a third great victory over the Persians on the river Larus, where he slew with his own hand a gigantic barbarian whom all feared to encounter. The last campaign of this war was however by far the most glorious. Constantinople was besieged by a great host of Persians and Avars, but instead of going to its relief Heraclius marched into the very heart of the Persian empire, overthrew the enemy in a great battle near Nineveh in Dec. 627, took Dastagerd or Artemita, the favorite residence of Chosroes, and plundered the royal palaces in the vicinity of untold treasure. In 628, Chosroes having been put to death by his son Siroes, the latter acceded to a treaty which closed the war and restored to Heraclius the provinces that had been wrested from his predecessor. The triumphant issue of the Persian war covered Heraclius with glory. His fame spread to the remotest extremities of Europe and India, and ambassadors came from the most distant princes to congratulate him on having vanquished the hereditary enemy of the Roman name. But hardly had he concluded peace with the Persians, when a new and more formidable foe appeared on the scene. At Edessa, as the emperor was returning from the war, an ambassador from Mohammed summoned him to embrace the faith of the prophet. Heraclius made a treaty of amity with the Arabian potentate; but peace was not the object of Mohammed or his disciples, and in a little time a war broke out between the Arabs and the eastern emperor, in which Syria, Palestine, and Egypt were wrested from the latter. Heraclius took no part personally in this contest, but spent his latter days in luxurious ease in Constantinople.

HERALDRY, the science of appropriating and marshalling coats of arms and other badges or marks of family rank and honor, also of recording or investigating genealogies, including in its fullest sense the proper direction of public ceremonies and solemnities. At the present day works on the subject are generally limited to blazonry, or the description in appropriate terms of armorial bearings. The origin of heraldry is believed to date from the use of armor, which by concealing the persons of knights in battle rendered some distinctive signs necessary. The early use of these signs is involved in obscurity, but it is known that it became general during the time of Henry I., and that it was greatly

stimulated by the crusades. The most ancient monument of true heraldry in Europe is found on a tomb in Ratisbon, dated MX., but such bearings did not become at all common for more than a century later. About 1300, heraldry appears to have become perfected as a system, and from that time coats of arms were constantly placed on coins and tombs and in architectural ornament. By men-at-arms they were principally borne on shields, banners, and military garments known as surcoats, jupons, and tabards. These last, embroidered with the royal arms, are still worn on state occasions by heralds in England. Before armorial bearings became hereditary in the 12th century, knights generally appear to have indulged in ornament indiscriminately. Thus on the Bayeux tapestry the shields are all represented as figured, and many with forms resembling those used in heraldry; but they are evidently portrayed without system. The term *blazonry* appears to have been derived from Germany, where the art was first developed, and from the word *blasen*, to blow, because all the earliest descriptions of arms were those made *viva voce* at tournaments by heralds, accompanied by the sound of a trumpet.—According to established authorities there are in heraldry 10 classes of arms: 1, those of dominion, which sovereigns bear, as derived from the realms they govern; 2, arms of pretension, borne by rulers not in actual possession of the realm to which such arms belong; 3, arms of community, such as are borne by bishoprics, cities, and bodies corporate; 4, arms of assumption, or such as are taken by any one according to heraldic law, without dispensation from the sovereign; 5, arms of patronage, such as rulers of provinces or patrons of benefices add to their own arms; 6, arms of succession, from inheritance of certain estates; 7, arms of alliance; 8, arms of adoption, granted by special permission of the sovereign to a person who has inherited property or an estate on condition of assuming a certain name; 9, arms of concession, or such of the royal insignia as the sovereign may choose to bestow on any one; 10, paternal and hereditary arms, such as are transmitted by the first possessor to his descendants. These 10 classes are however generally ranged in 3 principal ones: those of states, of communities, and of persons and families. The different parts of a coat of arms are the escutcheon or shield, the tinctures or colors, the charges or emblems in the field of the escutcheon, and the ornaments, which are figures accompanying or surrounding the escutcheon. The escutcheon is divided into 9 points or parts for convenience in describing the places of its charges; 3 of these range equidistantly across the upper part, 3 directly under them across the lower, and 3, also equidistant, perpendicularly between the central points. Those of the upper line are termed the dexter, middle, and sinister chiefs; those of the perpendicular the honor (uppermost), fess, and nombril points; and those of the lower the dexter, middle, and sinister bases.

The dexter side of an escutcheon is opposite to the left hand of the beholder. By the aid of these points of position and of a limited number of terms expressive of certain lines, a proficient in heraldry is able to describe or draw and color with accuracy and place objects in any coat of arms. Thus there are 9 principal divisions of the field by bands, which are called ordinaries and styled honorable, consisting of the chief, the pale, the bend, the bend sinister, the fess, the bar, the chevron, the cross, and the saltire. Again, in dividing the field of the escutcheon, when more than one metal or color is required, 8 kinds of crooked lines are used, termed engrailed, invected, wavy, embattled, nebuly, raguly, indented, or dancette; so that to describe the upper third of a shield bordered by a line of small semicircles reversed, it is simply necessary to write: "a chief engrailed." To these are added 9 subordinates expressive of certain geometrical forms occupying different positions. Colors in heraldry are 9, bearing Norman French names, and are expressed by a system of marks attributed to an Italian of the 17th century named Silvester de Petra Sancta. Thus, or or gold is known by the escutcheon being filled with small dots, gules or red by close perpendicular lines, azure or blue by horizontal lines, sable or black by perpendicular and horizontal lines crossing each other, vert or green by diagonal lines from dexter chief to sinister base, purple or purple by the same in the opposite direction, tenny or orange by perpendicular lines crossing diagonal lines from sinister chief to dexter base, and sanguine or murrey by diagonal lines from each side of the shield crossing each other. In order to distinguish persons of the same family, certain figures are used called differences, a usage dating from the time of Richard II. The great variety of objects, real or imaginary, such as crosses, shells, birds, beasts, dragons, stars, or flowers, which are borne in coat armor, are known by the general term of "common charges." The crest, surmounting the shield, is the next object to it in point of antiquity. This was worn anciently upon the helmet, and consequently the helmet itself often appears upon the arms of knights and noblemen. Richard I. is believed to have borne a crest. Edward III. was the first who introduced his crest upon the great seal of England. The crest, unless expressly stated to be on a chapeau or coronet, is always understood to be on a wreath. Supporters are figures placed on each side of the shield, and are thought by some to have originated in fanciful devices introduced by early seal engravers to fill up vacant spaces; but Menestrier thinks that they originated from its being customary for knights at tournaments, when not taking part in the exercises, to have their arms guarded by pages in fantastic dresses. In England no person below the dignity of a knight of the bath has a right to them, except by special royal grant. A motto is, according to Guillim, "a word, saying, or sentence which

gentlemen carry in a scroll under the arms, and sometimes over the crest." They had their origin in the war cries of knights, though there are instances of a motto being borne differing from the war cry of the wearer. The first known in England is said to have been that given by Edward III. to the knights of the garter. The scroll is an ornament placed below the shield, and in this is inscribed the motto. Hatchments, or funeral escutcheons, are the armorial ensigns placed on the fronts of houses when any of the nobility or gentry die. They are of diamond shape, placed with the points perpendicular, containing the arms, the ground or portions of it being colored sable in such a way, and the arms being so quartered, that it may be at once known upon sight of the hatchment what branch of a family is dead, and whether the deceased was married, single, widow, or widower.—The offices of heraldry are at present maintained in England by officers appointed by the earl marshal, but most of the functions and privileges which they once held have become obsolete. They are 14, viz., 4 kings at arms, 6 heralds, and 4 pursuivants. The herald's college, or college of arms, is a corporation consisting of all the above officers with the exception of one of the kings-at-arms, whose duties are to preserve records, to execute the royal commands regarding great public ceremonies, and to give professional advice and assistance in tracing pedigrees and the descent of properties and titles, for registering nominal and armorial additions and distinctions sanctioned by the sovereign, and for granting coats of arms when the royal assent is not indispensable. In Scotland there is one king-at-arms, and one also in Ireland.—Since the decline of chivalry, heraldry has fallen into comparative neglect, and at one time attracted but little attention from scholars. Of late, however, it is more studied as an aid in historical investigations. Among the more recent writers on heraldry are the Rev. T. Hamerton, "Observations on Heraldry" (London, 1851); I. R. Planché, "The Pursuivant of Arms, or Heraldry founded upon Facts" (1851); and M. A. Lower, "Curiosities of Heraldry."

HERAPATH, WILLIAM, an English chemist, born in Bristol, May 26, 1796. He is the son of a brewer. Having completed his education, and spent some time in a banking house, he was called to conduct the business of his father, who was killed by an accident. He gave his leisure to chemistry, for which he had always displayed much taste and aptitude. His first paper, "On the Specific Gravity of the Metallic Oxides," was published in the "Philosophical Magazine." He has devoted himself exclusively to chemistry since 1830, when he retired from his brewery. He was one of the first to detect cadmium in the ores of England.

HERAT, or HERAUT, a city of Afghanistan, capital of a state of the same name, on the Heri, 360 m. W. from Cabool, and 190 m. S. E. from Mushed; pop. about 50,000. It is situated in

a plain 2,500 feet above the level of the sea, and is strongly fortified. The streets are ill built, narrow, and dirty. The principal public edifices are the citadel, mosques, bazaars, caravansaries, baths, and the palace of the khan. One of the bazaars is 1,300 yards in length, and roofed with arched brickwork. The staple manufactures include carpets, cloaks, caps, shoes, saddlery, harness, sabres, and dressed sheep skins. Herat is a place of great military and commercial importance, being the "gate of India" on the N. W., and the point where the shawls, chintzes, muslins, indigo, &c., of India and Afghanistan are exchanged for the products of China, Russia, Turkey, and Persia.—At the commencement of the 19th century Herat belonged to the dominions of Siman Shah, the sovereign of Afghanistan. But there were two rival families in the state—that of the king, of the Suddosi tribe, and that of Futteh Khan and his 20 brothers, of whom Dost Mohammed was the youngest. The family of Futteh Khan eventually triumphed over their rivals, and divided Afghanistan among themselves, except Herat, which remained in the hands of the brother of Siman Shah. In 1837, under the vizership of Yar Mohammed, the Persians appeared before Herat and subjected it to one of the most memorable sieges in modern times, lasting from Nov. 22, 1837, to Sept. 9, 1838, which the town was able to resist in consequence of the exertions of Lieut. Pottinger, of the Bombay artillery. In May, 1843, when Kamran, the chieftain of Herat, died, Yar Mohammed made himself master of the town, to the exclusion of Kamran's son. At his death in 1851 he transmitted his power to his son Mohammed Said, whose conduct became so unsatisfactory, that with the consent of the people, and the military assistance of the shah of Persia, he was supplanted by Yussuf, a prince of the Suddosi family, who in 1855 captured Herat and proclaimed himself chief as the vassal of Persia. He acted under Russian and was opposed to English influence. The proposed expulsion of an agent of the English government and the dictatorial attitude of the Persian shah fomented discord, in consequence of which Yussuf was driven from power by Esa Khan, who usurped it. These intestine troubles gave an opportunity to the Persians to gratify their long cherished ambition. They advanced upon Herat, besieged the town, and captured it, Oct. 26, 1856. This led to war between Persia and England, since the latter government looked upon the capture of Herat as a breach of the treaty of 1853. The Persians were defeated on several occasions, and compelled to sign the treaty at Teheran, April 14, 1857, by which the shah renounced all his claims on Herat.

HÉRAULT, a department in the S. of France, in the ancient province of Languedoc, bounded N. by the departments of Gard and Aveyron, E. by Gard, S. by Aude and the Mediterranean, and W. by Aude and Tarn; area, 2,444 sq. m.; pop. in 1856, 400,424. The surface is mountainous in the N., but in the S. are plains, which slope down

to the sea. Between the mountains and the plains there runs from E. to W., through the entire length of the department, a band of stony earth which allows of no cultivation but that of the olive and the vine. The principal river is the Hérault; there are also several canals. The climate is dry and very warm, and, except near the marshes, which are on the S. coast, healthy. Olives and grapes are the chief agricultural products. The best wines are the red wines of St. George, St. Christol, Orgues, and St. Geniès, and the white wines of Lunel and Frontignan. Brandies, cloths, woollens, silks, liqueurs, perfumes, paper, pottery, and candles are manufactured; there are mines of iron, copper, and coal, and marble quarries. Capital, Montpellier.

HÉRAULT DE SÉCHELLES, MARIE JEAN, a French revolutionist, born of an ancient and noble family in Paris in 1760, guillotined there, April 5, 1794. At 20 years of age he was a royal advocate at the Châtelet. He was so remarkable for eloquence, intelligence, and agreeable personal qualities, that the queen Marie Antoinette requested that he might be presented to her, which was done by the duchess de Polignac. He was soon promoted to the post of advocate-general at the Châtelet, but became an ardent friend of the revolution, and distinguished himself by personal bravery at the siege of the Bastille. After the reorganization of the legal system he was appointed royal commissioner of the court of cassation. In Sept. 1791, he was elected by the city of Paris to the legislative assembly, where he at once joined the extreme left. Having been returned to the convention by the department of Seine-et-Oise, he was chosen president of that body, Nov. 2, 1792. He was one of the commissioners sent to organize the department of Mont Blanc, and, while absent from Paris on this mission, signed a letter voting for the "condemnation" of the king, after the words "to death" had been stricken from it at the request of one of his colleagues, the abbé Grégoire. He joined Danton and Lacroix in demanding the trial of Henriot, and presided at the well known sitting of June 2, 1793, when he proclaimed the proscription of the Girondins. On June 10 he presented a report from the committee of public safety on the proposed constitution which had been drawn up mainly by himself, but it was not accepted. He also presided at the great *fête* of Aug. 10, 1793. As a member of the committee of public safety, Hérault proposed many measures of great severity, and was mainly instrumental in obtaining for the committee the power of arresting *suspects*. In Sept. 1793, he was sent on a mission to Alsace, whence he wrote: "I have planted guillotines on my route, and find that it has produced good effects." He became however embroiled with his colleagues, owing in great part to the enmity of Robespierre, and on a frivolous pretence was arrested and imprisoned. Finally (March 31, 1794) St. Just accused him in the convention of having conspired against the government and of having

protected the *émigrée*. After trial (April 2) he was condemned to death with Danton, Desmoulins, and others. While awaiting the hour of execution he passed the time in reading J. J. Rousseau. He had anticipated death by the guillotine for many months, and finally met it with indifference. Among his best works are his *Visite à Buffon* (Paris, 1785), and *Théorie de l'ambition* (1802), which was written during his last imprisonment.

HERBARIUM, a collection of dried plants. The stems and leaves or the flowers are carefully pressed between sheets of paper, to one of which they are sometimes glued or otherwise secured. The sheets are often bound in book form. In this way large collections of great scientific interest may be preserved in small compass. Among the most famous collections of this kind are, that in the museum at Paris, the imperial collection of Vienna, that of Linnaeus now in London, and that of the British museum, formerly belonging to Sir Joseph Banks.

HERBART, JOHANN FRIEDRICH, a German philosopher, born in Oldenburg, May 4, 1776, died in Göttingen, Aug. 14, 1841. He was educated at Jena, at the age of 12 was familiar with the systems of Wolf and Kant, and afterward studied the lectures of Fichte with enthusiasm, but began to differ from his new master before leaving the university. After teaching at Bern, where he was intimate with Pestalozzi, and wrote a treatise on his system of education, he went in 1802 to Göttingen, where he delivered private lectures on philosophy, till in 1805 he was appointed extraordinary professor. In 1809 he accepted the chair of philosophy at Königsberg, whence he was recalled in 1833 to Göttingen with the dignities of titular professor of philosophy and aulic councillor, which he held till his death. He published the various parts of his system only at long intervals, and gradually became the head of a school whose principal seats were at Göttingen and Leipsic. His philosophy was a reaction against the reigning idealism, and contains at once the empiricism of Locke and Condillac, the monadism of Leibnitz, the criticism of Kant, and the mathematical idealism of Bardili, with proofs throughout of his own acuteness and originality. The basis of all philosophy, according to him, is the whole sum of the phenomena that pass through the human mind, the whole mass of our ordinary convictions. These convictions involve the most palpable errors, and are at once refuted by the reason. It is the task of philosophy to so elaborate and interpret the conflicting ideas of experience and reason as to eliminate the contradictions between them and to leave a clear view of truth. We have 3 fundamental notions, viz., of thing, matter, and mind, each of which involves a separate contradiction, and points to a distinct department of metaphysics, respectively to ontology, synecology, and eidology. We perceive a thing as a unity, though the reason finds nothing but a collection of properties. We contemplate matter as an ob-

ject existing in space, though it consists of atoms infinitely divisible, which therefore in their ultimate form can fill no space at all. We feel the mind to be one, yet it is conscious of an ever-changing multiplicity and diversity of states and feelings. The instrument with which Herbart reconciles these contradictions is what he terms reals (*Realen*), which resemble the atoms of the Eleatic theory and the monads of Leibnitz. The real or monad is the ultimate fact, which cannot be denied; it is at once absolute being and absolute position. A thing, instead of being simple, is composed of many of these separate and independent essences, which are all absolutely the same. To explain, therefore, the various characteristics presented by different things, he introduced his doctrine of accidental views, a term borrowed from mathematics, showing that though the essences remain the same they may appear different according to their relations, as the same line may be considered as radius or as tangent, and a tone as harmonious or discordant. Matter, being composed of spaceless monads, is immaterial, and space is therefore objectively unreal. But though each monad is a mathematical point, expressing simply locality and no space, if several of them be brought together in the same direction, we get the idea of a line, and may thus complete what he terms an "intelligible space" in its 3 directions. Space, as also time and motion, only expresses a relation in which objects stand to each other. The soul is a monad, simple, eternal, and indissoluble, and Herbart combats the psychologists who ascribe to it various powers and faculties. The causes of its different states are the relations in which it stands with other monads which press against it and try to represent themselves in it from different sides, consciousness being the sum of these representations. If the other monads are driven back and work in the darkness while they wait to mirror themselves on the consciousness, they are feelings. Feeling becomes desire as in its struggle forward it begins to aim at success, and desire becomes will when united with the hope of success. Throughout this mechanical theory of the soul every thing is calculated according to the doctrine of statics. The character and conduct of a man will depend upon the constant reflection in his consciousness of a certain number of monads, while others but dimly appear or are stopped at the threshold. Having thus completed the province of theoretical philosophy, he makes a transition to faith, as the ground of our religious conceptions, nearly identical with that of Kant from the pure to the practical reason. His moral philosophy is grounded entirely upon æsthetic judgments. The principal disciples of Herbart are Röer, Allihn, Drobisch, Hartenstein, Strümpell, Exner, Thilo, Volkmann, and Weitz. His minor philosophical writings, with a biography by Hartenstein, were published at Leipsic (3 vols., 1841-'3); his complete works were edited by Hartenstein (12 vols., Leipsic, 1850-'52).

HERBELOT, BARTHÉLEMY D', a French orientalist, born in Paris, Dec. 4, 1625, died there, Dec. 8, 1695. He acquired a knowledge of Hebrew, Arabic, Syriac, Persian, and Turkish, and twice visited Italy to obtain instruction from some of the orientals who frequented Genoa, Leghorn, and Venice. In the last years of his life he was professor of Syriac at the *collège de France*. He left several inedited works, of which the *Bibliothèque orientale, ou dictionnaire universel, contenant tout ce qui fait connaître les peuples de l'Orient* (fol., Paris, 1697), was published two years after his death.

HERBERT, EDWARD, Baron Herbert of Cherbury, an English diplomatist and philosopher, born in Montgomery, Wales, in 1581, died in London, Aug. 20, 1648. He was married at 15, completed his education at Oxford, and in 1600 went to London, where he was presented to Queen Elizabeth. On the accession of James I. he was made a knight of the bath. In 1608 he went to the continent, and visited France. In 1610 he joined the English auxiliaries in the Netherlands under the command of Maurice of Nassau, prince of Orange, and served in the siege of Juliers. In 1614, under the same commander, he served in a second campaign against the Spaniards. He distinguished himself in these wars by great intrepidity and daring. He then made a journey to Italy, where the duke of Savoy intrusted him with the guidance of 4,000 Languedoc Protestants into Piedmont. He was arrested under the charge of recruiting for the duke, but was soon set at liberty. In 1616 he was appointed by King James ambassador extraordinary to France, to renew the alliance between France and England. Very sensitive on all points of honor, he involved himself in many difficulties, and especially offended the duke de Luynes, a favorite of the king, at whose instigation he was recalled to England. On the death of De Luynes (1621) he was sent again to France, and while there published his first work, *Tractatus de Veritate* (Paris, 1624). In 1625 he returned to England, and was created baron of Castle Island in the peerage of Ireland, and from this time devoted himself entirely to the duties of his station and to literature. In 1629 he was elevated to the English peerage, under the title of Baron Herbert of Cherbury. He was an original thinker, and, professing to put his hopes in God, he was still believed to be without religion; indeed he was ranked by some among materialists and atheists. He was attacked violently both for his religion and his philosophy. Hobbes was one of the most powerful of his opponents. Leland, in his review of the deistical writers of England of the 17th and 18th centuries, assigns to Lord Herbert a prominent place among them. Channing says his deism has much in common with Christian Unitarianism. In the disturbances in the reign of Charles I. he first sided with parliament, and afterward with the king. Among his works, beside that mentioned above, are: *De Religione Gentilium, Errorumque apud eos Causis* (1656);

Expediit (Buckinghami Ducis) in Ream Insulam (1656); and the "Life and Reign of King Henry VIII." (1672), which last is the best known of his works. His autobiography was printed by Horace Walpole in 1764.

HERBERT, GEORGE, an English clergyman and poet, 5th brother of the preceding, born at Montgomery castle, Wales, April 3, 1593, died in Bemerton, England, in Feb. 1632. He was educated at Westminster and at Trinity college, Cambridge, elected fellow of the college in 1615, and in 1619 public orator, which was in those days a great honor. He did not however pass much of his time at Cambridge, but was generally an attendant of the court. King James, whose favor he had gained by an elegant letter to him in Latin, presented him with a sinecure office worth £120 a year. The death of two of his most powerful friends, the duke of Richmond and the marquis of Hamilton, soon followed by that of the king, induced him to take holy orders. He was made by Bishop Williams prebendary of Leighton Bromswold, or Layton Ecclesia, in 1626. In 1630 Charles I., at the request of the earl of Pembroke, presented him with the living of Bemerton, near Salisbury, and here he remained till his death. As a pastor he was most exemplary and zealous, and he was generally known as "holy George Herbert." His verses are quaint and full of imagery, but with many beautiful thoughts and holy precepts. They are of the same school as those of Quarles and Donne. George Herbert was the intimate friend of Sir Henry Wotton, Dr. Donne, and Lord Bacon. Indeed the latter, whose acquaintance he made at Cambridge, is said to have had so high an opinion of his judgment as to have submitted his works to him before publishing them. Herbert's principal works are: "The Temple; Sacred Poems and Private Ejaculations" (Cambridge, 1633); "Outlandish Proverbs, Sentences, &c." (London, 1640); "Quadrupartit Devotions" (1647); "The Priest to the Temple, or the Character of a Country Parson" (1647); "Remains," prose writings (1652). His life was written by Izaak Walton.

HERBERT, HENRY WILLIAM, an American author of English birth, born in London, April 7, 1807, died by his own hand in New York, May 17, 1858. From his father, the Hon. and Rev. William Herbert, dean of Manchester, who was distinguished for extensive and varied learning, he acquired a literary taste subsequently developed at Eton college, which he entered at 13 years of age, and at Caius college, Cambridge, where he was graduated in 1828. He came to the United States in 1831, and until 1839 was employed in New York as teacher of Greek in the school of the Rev. Mr. Huddart. During this time he began to write for the public, and from 1833 to 1836 was editor of the "American Monthly Magazine," at one time in connection with C. F. Hoffman. In 1834 he published his first historical novel, "The Brothers, a Tale of the Fronde," followed

by "Cromwell" (1837), "Marmaduke Wyvil" (1843), and "The Roman Traitor" (1848). During this time he acquired a reputation as an authority on sporting matters, but wrote on a great variety of subjects, many drawn from French and English history, a number of works which enjoyed in their time great popularity. For several years previous to his death Mr. Herbert resided near Newark, N. J. In addition to 14 novels, he was the author of several works on different eras of history, and was also a copious translator, having made versions of several French romances, of Weiss's "Protestant Refugees" (New York, 1854), of the "Prometheus" and "Agamemnon" of Æschylus, and of poetry from French and Italian authors. His most celebrated and characteristic works were, however, on sporting, published under the pseudonyme of Frank Forester, namely: "The Field Sports of the United States and British Provinces" (1849), "Frank Forester and his Friends" (London, 1849), the "Fish and Fishing of the United States," &c. (New York, 1850), "Young Sportsman's Complete Manual," "The Horse and Horsemanship of the United States and British Provinces of North America" (2 vols. 4to., 1857), and "American Game." Mr. Herbert also edited various works, and was a versatile contributor to the leading literary magazines and journals of the country. As a writer on field sports he was the first in America to give prominence to a department of literature which has of late years become both copious and popular.

HERBERT, JOHN ROGERS, an English historical painter, born in Maldon, Essex, Jan. 23, 1810. He became a student in the royal academy while a boy, and before the age of 24 had acquired considerable reputation as a portrait painter. Among his sitters was the princess Victoria. He afterward devoted himself to works of history and *genre*, and distinguished himself by a carefulness of finish and an accuracy and significance of detail which the pre-Raphaelites have since more fully developed. About 1839 he became a convert to the Roman Catholic church, and during the next few years gave his attention in a great measure to religious subjects. Latterly he has been almost exclusively employed on the decoration of the new houses of parliament, for which he has furnished several cartoons, illustrating the story of King Lear, and a series of 9 scriptural subjects. In 1846 he was elected a member of the royal academy.

HERBERT, SIDNEY, an English statesman, born in Richmond, near London, Sept. 16, 1810. His father was the 11th earl of Pembroke, his mother the only daughter of Count Simon Woronzoff, a Russian nobleman; and his eldest brother is the present earl of Pembroke, whose wife, the princess Octavia Spinelli, daughter of the duke of Laurino and widow of the Sicilian prince Buttera de Rubari, died childless in 1857. Sidney Herbert was educated at Harrow and Oriel college, Oxford, where he was graduated

in 1831. He became member of parliament for South Wilts in 1832, and has since continued to represent that county almost uninterruptedly. He seconded in 1834 a resolution for the exclusion of dissenters from the university of Oxford, and voted in 1838 against the introduction of the ballot, but subsequently became zealous in behalf of liberal measures. He advocated a modification of the corn laws, and in 1841, on the accession of Sir Robert Peel, he became secretary at the admiralty, till Feb. 1845, when he officiated as secretary at war with a seat in the cabinet, till July, 1846. He was one of the most influential and active supporters of Sir Robert Peel, and several elaborate speeches in behalf of free trade attest his parliamentary ability. During Lord John Russell's administration (1846-'52) he sided with the opposition, and did not resume his office as secretary at war until Dec. 28, 1852, under the Aberdeen administration. In 1855 he accepted the direction of colonial affairs in the cabinet of Lord Palmerston, but, along with some other members of the Peelite party, he resigned after a few weeks, on account of the appointment of a committee of inquiry into the state of the army before Sebastopol, which was considered as implying a censure on the administration of Lord Aberdeen. In 1857 he voted against the Chinese war and in favor of an extension of the elective franchise. In June, 1859, he resumed his place in the new Palmerston cabinet as secretary at war. He married in 1846 the only daughter of Lieut. Gen. Ashe à Court, by whom he has many children.

HERBERT, SIR THOMAS, an English traveler and author, born in York about 1606, died there in 1682. He studied at Oxford and Cambridge, and in 1626 accompanied Sir Dodmore Cotton on his embassy to Persia. He returned to England in 4 years, after having visited Persia, northern Africa, and the East Indies, and in 1634 published a work entitled "Some Yeares Travels into Africa and the Great Asia, especially the Territories of the Persian Monarchy," &c. In the civil war Herbert took the side of the parliament, was one of the commissioners of Halifax, and was sent by parliament among the deputies to Newcastle to receive the king from the Scotch. Charles was so won by his kind and courteous behavior, that, though he was a Presbyterian, he retained him to the last, after his other attendants had been dismissed. Herbert, for his services to the king, was rewarded by Charles II. with the title of baronet. Together with some others, he wrote the *Threnodia Carolina*, an account of the last two years of the life of King Charles I. (1678, reprinted in 1813).

HERBERT, WILLIAM, 3d earl of Pembroke, an English poet, born in Wilton, Wiltshire, April 8, 1580, died in London, April 10, 1630. He was a chancellor of the university of Oxford, a knight of the garter, for some time governor of Portsmouth, and lord chamberlain of the royal household, a contributor to the Bodleian library

of valuable Greek MSS., and gave his name to Pembroke college, Oxford. He wrote poems of little merit, and some of a licentious character; but great interest is attached to his name on account of the supposition of recent inquirers that he was the W. H. of Shakespeare's sonnets. Herbert, whose character is admirably drawn by Clarendon in his "History of the Rebellion," was a man of learning and of a noble and gallant character, though of a licentious mode of life. Hallam, in his "History of the Literature of Europe," favors the belief that he really was the idolized friend of the great English dramatist, although he admits the fact is not proved.

HERBERT, WILLIAM, an English clergyman and author, born in 1778, died in 1847. He was the 3d son of Henry, earl of Carnarvon, and a graduate of Oxford, practised for some time at doctors' commons, was a member of the house of commons, afterward took orders, and in 1840 became dean of Manchester. He was one of the earliest contributors to the "Edinburgh Review," and his editorial and original labors comprised a wide range of literary activity. Among his most noted works are a series of translations from the Norse, Italian, Spanish, Portuguese, German, Danish, &c.; "Helga," an original poem founded on Scandinavian history and manners; and lastly his celebrated poem on Attila, which was highly eulogized by his friend Henry Hallam, and pronounced by an Edinburgh reviewer one of the most Miltonian poems of the last 20 years. This poem is included in his miscellaneous works (3 vols., London, 1838-'42).

HERCULANEUM, an ancient city of southern Italy, about 5 m. S. E. from Naples, supposed to have been founded by the Pelasgi, and inhabited by a mixed race of Pelasgic, Oscan, and Greek descent. Delightfully situated upon the coast of Campania, at the foot of Vesuvius, the town was a place of resort for many wealthy Romans; but it was of no special commercial importance. In A. D. 63 there occurred a terrible earthquake, which nearly destroyed this and the neighboring city of Pompeii, a notice of which was recorded by the historians of that period. But in the accounts of the greater catastrophe which overwhelmed these cities 16 years afterward, no allusion is made to them, and in subsequent writings no mention is made of their former existence. The younger Pliny in two letters to Tacitus described the sudden appearance of a cloud which rose in the afternoon of Aug. 24, A. D. 79, over Vesuvius, shooting upward to a great height and spreading out at top like a pine tree; and succeeding this appearance the precipitation of showers of ashes and cinders, which filled the atmosphere, producing intense darkness that continued to the 3d day. His uncle the elder Pliny, admiral of the fleet at Misenum, entered his vessel and ordered the others to proceed to the assistance of the inhabitants along the shore. He reached Stabiae, the hot cinders falling on the decks of the ships, and entered the house of his friend Pompiannus. Flames were raging around,

and the court of the house was fast filling with cinders. Retreating to the shore in the intense darkness, protected by pillows upon their heads, they found the sea too tempestuous for them to embark. Pliny then laid himself upon a sail on the shore, and his companions fled before the sulphurous flames. Here his body was found 3 days afterward. Previous to this eruption of Vesuvius the only evidence of the mountain being volcanic was in the ancient lavas around it. For ages it had been quiet, and its fertile slopes, as recorded in the epigram of Martial, were clothed with flourishing vineyards. The showers of ashes, cinders, and stones continued for 8 days and nights, accompanied with frequent torrents of rain; and when quiet was restored, the cities of Herculaneum, Pompeii, and Stabiae had disappeared, and in the widespread desolation no landmarks remained by which to fix their sites. By later eruptions currents of lava have added beds of solid rocky materials to the accumulations over Herculaneum, burying the city, as was ascertained in the last century, to the depth of 80 to 112 feet. Sir William Hamilton states in the "Philosophical Transactions," vol. lxi., that there appear to have been 6 subsequent overflows, principally of melted lava, and that sufficient time elapsed after each for the formation of a soil, which may still be observed between the layers of lava where a section of these is exposed to view. The ejected matters which first buried the city and filled the houses were volcanic ashes or dust, pumice stones, and cinders, which when agglomerated together in masses constitute the tufa of the Italians, used by them as a building stone. It is by these matters only that Pompeii has remained covered, the later flows of lava not having reached the locality. The thickness of its covering consequently hardly exceeds 15 to 20 feet. Had melted lavas flowed first through these cities, all vestige of them would probably have been irrevocably lost; but the layer of tufa has served to preserve the objects it covered from the destructive effects of the subsequent fiery currents. The materials of the tufa, Sir William Hamilton supposes, were chiefly carried in as a stream of liquid mud; and this in hardening retained the impressions of the objects it engulfed as perfectly as if these had been taken in plaster of Paris. The modern discovery of Herculaneum resulted from the digging of a well in the year 1709. Ancient works of art were brought to light, but the Neapolitan government finally prohibited further explorations. In 1738 they were recommenced, and have since been prosecuted at intervals. The area examined is estimated not to exceed 600 yards in length by 300 in breadth; and portions once excavated are again filled in with rubbish to avoid the expense of raising this to the surface. Underground passages like those of a mine have been opened along some of the streets, and private and public buildings have been explored and partially uncovered, without however exposing them to the light

of day. A large and highly ornamented theatre, capable of seating about 8,000 persons, its walls highly decorated, and its floors and pillars constructed of different colored marbles, is the most important building discovered. A basilica standing near by contained the largest pieces of painting, copies of which have been engraved, together with representations of numerous objects of interest found in the ruins, in the work prepared by order of the king of the Two Sicilies, entitled *Antichità di Ercolano* (9 vols. imp. fol., Naples, 1757-'92). The streets of the city are found to be paved with lava, as are now the streets of Naples. One was more than 30 feet wide, and furnished with raised sidewalks. The houses were generally small and of irregular shape, built of brick, and only one story high. The walls were frequently found to be cracked, and some had been braced up with props, no doubt in consequence of the earthquake which had seriously damaged the town 16 years previous to its final destruction. The various relics obtained were first deposited in the royal museum at Portici, and afterward were removed to the Museo Borbonico at Naples. A collection of manuscripts nearly 2,000 in number excited great interest, in the hope that among them might be found some of the lost works of the great classic writers. They were in the form of rolls of papyrus, some upon a stick which had become converted into charcoal; and the substance of the paper was in many instances so changed that it resembled a sort of skeleton of a leaf holding together the mixed earthy and carbonaceous matter. In many the substance which composed the letters appeared to have been removed from its place and gathered in the folds in spots and lines of the finest charcoal. The unrolling and deciphering of the most perfect of these manuscripts was a task demanding the greatest patience and ingenuity. It was undertaken about the middle of the last century by a skillful copyist, Antonio Piaggi, who after long continued application succeeded in transferring to paper facsimiles of many of the manuscripts. The Neapolitan government did not make public the nature of any of the manuscripts for 40 years. They then published in 1793 a specimen, which proved to be a dull treatise on music by Philodemus, an Epicurean, showing the injurious influence of the art, and the importance of discouraging it. The prince of Wales, afterward George IV., took great interest in the investigation of these manuscripts. His chaplain, the Rev. John Hayter, was occupied at Naples from 1802 to 1806 in producing facsimiles of them. Copies of 94 were sent to the prince, and were by him presented to the university of Oxford; and in 1824-'5 two volumes were published at Oxford of these original treatises, in Greek as they were found with all their imperfections. The essays are on various subjects, many very short, and none possess extraordinary merit. In 1818 Sir Humphry Davy was sent by the prince of Wales to Naples to experiment upon

the manuscripts, and in 1821 he furnished a paper in the "Philosophical Transactions" presenting the results of his investigations. He saw no evidence in the charred condition of the manuscripts of their having been acted upon by great heat; but rather referred this condition to the effect of the slow and long continued process of decomposition. Those which had become black he thought had been exposed to moisture; and some, which also contained earthy matter, he supposed had been long acted upon by warm water which held earthy substances in suspension, and which dissolved and dispersed the ink and the soluble starch and gluten used in preparing the papyrus. Though the wood in the houses was converted into charcoal, and the papyrus was sometimes mere white ashes, the colors upon the frescoed walls were fresh and uninjured, indicating that these could not have been subjected to a high degree of heat. He succeeded in partially unrolling a few more manuscripts.—The works of art taken from the ruins, and now deposited in the Museo Borbonico, comprise a great variety of statues and bronze busts, and ornamental articles of furniture, some of which, as the candelabra, lamps, vessels of sacrifice, &c., are admirably executed, and evince a highly cultivated taste in the arts of design. Rooms are filled with instruments of various kinds, musical, surgical, and those belonging to the toilet and employed for domestic purposes. There are mirrors of polished metal, colored glasses imitating precious stones, and cooking utensils of great variety, among them pans of copper lined with silver. Even the etables themselves are recognized in their charred remains. The best of the fresco paintings have been ingeniously removed from the stuccoed walls, and are now preserved under glass. Their colors are still bright, though after exposure to the air they lose in part the brilliancy they exhibited when first uncovered. They are chiefly of mythological subjects, and are readily understood by those familiar with Grecian history and mythology.—Among the various works on the subject are those of David, *Antiquités d'Herculanéum* (12 vols., Paris, 1780-1803); Piranesi, *Antiquités d'Herculanéum* (6 vols., Paris, 1804-'6); R. Walpole and W. Drummond, *Herculanensia* (London, 1810); and a very complete work by Wilhelm Zahn, *Die schönsten Ornamente und merkwürdigsten Gemälde aus Pompeji, Herculanéum und Stabä* (Berlin, 1828).

HERCULANO DE CARVALHO, ALESSANDRO, a Portuguese writer and poet, born in Guimaraens in 1796. He was sent to study at Paris, where he distinguished himself by his knowledge of European languages and literature. He identified himself soon after returning to Portugal with the revolutionary party, and took an active part in 1820 in the popular movement at Oporto which resulted in the proclamation of a constitutional government. In 1826 he published a strange politico-religious poem, *A voz de propheta*, in which, in a sort of

apocalyptic vision, he set forth the sufferings of his country, then distracted by civil war. This was followed in 1832 by *A harpa do crente*, a collection of lesser lyrics. He also wrote a novel, *Eurich*, and *Historia de Portugal* (Lisbon, 1848-'52). Of late years he has devoted himself to the publication of a series of romances in the style of Sir Walter Scott, illustrating passages in the history of Portugal.

HERCULES (Gr. Ἡρακλῆς), the most renowned of the mythical heroes of antiquity, son of Jupiter by Alcmena, the granddaughter of Perseus. He was destined by Jupiter to occupy the throne of Perseus, but by the contrivance of Juno was superseded by Eurystheus, the grandson of that hero. His supernatural strength rendered him an object of terror to Eurystheus, who imposed on him a series of enterprises which no mere mortal could have accomplished. These enterprises are generally termed the twelve labors of Hercules. They were the following: 1. The fight with the Nemean lion. The valley of Nemea, between Cleonæ and Phlius, was infested by a monstrous lion. Hercules blocked up one of the entrances to the den, entered it by the other, strangled the lion, and brought the carcass to Eurystheus. 2. The fight with the Lernaean hydra. In the district of Lerna, near Argos, dwelt a huge hydra having 9 heads, the middle one immortal. Eurystheus desired the death of this monster, and Hercules, having roused the hydra from his lair, cut off its heads, but in place of every head cut off two new ones sprung up. With the assistance of his servant Iolaus, however, he burned the mortal heads of the monster, and buried the immortal one under a rock. 3. The capture of the Arcadian stag. This animal had golden horns and brazen feet, and was of surpassing swiftness. Hercules was ordered to bring it alive to Mycenæ. For a whole year he pursued it in vain. It fled to Mt. Artemisium in Argolis, and thence back to Arcadia. At length, weary of pursuing, the hero discharged an arrow at it, which, by wounding the animal, enabled him to catch it, and carry it to Mycenæ. 4. The hunt of the Erymanthian boar. This boar had descended from Mt. Erymanthus into Psophis, and Hercules was ordered to bring him alive to Eurystheus. He chased the brute through the deep snow till, having tired him down, he caught him in a net. 5. The cleansing of the Augean stables. Augeas, king of Elis, had a herd of 3,000 oxen, whose stalls had not been cleansed for 30 years. Eurystheus commanded Hercules to clean them in one day, deeming such a thing impossible. Hercules, however, succeeded in accomplishing it by turning the rivers Alpheus and Peneus through the stables. 6. The destruction of the Stymphalian birds, an innumerable swarm of voracious creatures, whose claws, wings, and beaks were of brass, who used their feathers as arrows, and who fed upon human flesh. They had taken refuge in a lake near Stymphalus, whence Hercules startled them with a rattle, and then

killed them with his arrows as they attempted to fly away. 7. The capture of the Cretan bull. This bull was a sacrificial gift from Neptune to Minos; but as Minos neglected to sacrifice him, Neptune caused the bull to go mad, and to make great havoc in Crete. Hercules was commanded to catch him, and bring him to Mycenæ. He did so, but then set the animal free, to the great terror of Greece. 8. The abduction of the mares of Diomedes, a Thracian prince who fed his mares with human flesh. Eurystheus sent Hercules to bring them to him. Hercules had conducted them to the sea coast, when he was overtaken and attacked. Having vanquished the Thracians, and slain Diomedes, he cast his body to the mares, which became tame after eating the flesh of their master. Hercules then embarked with them, and brought them to Eurystheus. 9. The seizure of the girdle of Hippolyte, queen of the Amazons, which she had received from Mars. Hercules set sail from Peloponnesus and landed at Themiscyra, where he was hospitably entertained by Hippolyte, who promised him the girdle. But the malignity of Juno rousing the Amazons against him, he, deeming the queen a party to the conspiracy, slew her, possessed himself of her girdle, and arrived with it in safety at Mycenæ. 10. The capture of the oxen of Geryones, a monster who lived in the island of Erythia, and who had a herd of red oxen which fed with those of Helios, and were guarded by the giant Eurytion and the two-headed dog Orthrus. Erythia was in the ocean far to the west, and in his journey to it Hercules erected the pillars of Calpe and Abyla on the frontiers of Europe and Libya, hence called the pillars of Hercules. He killed Orthrus, Eurytion, and Geryones, and carried off the oxen, which, after overcoming the efforts of gods and men to deprive him of them, he brought at length to Eurystheus. 11. The getting of the golden apples of the Hesperides. These apples had been presented by Terra to Juno, by whom they had been intrusted to the keeping of the Hesperides and the dragon Ladon, in some remote region of the west. Hercules, with the aid of Atlas, obtained the golden apples, which on his return he gave to Eurystheus. 12. The seizure of Cerberus, the dog that guarded the entrance to Hades. On arriving in Hades, Hercules asked permission of Pluto to take Cerberus, and the god yielded his assent, provided he could do so without having recourse to arms. Hercules agreed to the condition, and, seizing Cerberus, he bore him, notwithstanding his fierceness, to the upper world, showed him to Eurystheus, and immediately after carried the monster back to Hades.—In the original legends concerning Hercules he figures as a mighty chieftain, who subdues Troy and wages successful war against Argos and Lacedæmon; who dethrones princes, and gives away kingdoms and sceptres. The worship of Hercules prevailed especially among the Dorians; and the sacrifices offered to him were chiefly bulls, boars, rams, and lambs. He was

also worshipped at Rome, and in many other parts of the ancient world. In works of art he is represented in all the various stages of life, from infancy to death; but whether he appears as a child, a hero, or a celestial, his character is always that of supernatural strength and energy.

HERCULES, PILARS OF (Lat. *Columnæ Herculis*). See GIBRALTAR.

HERCYNIA SILVA, the ancient name of a forest of Germany, covering a mountain range whose position and extent are very differently described by various writers. It probably comprised the whole mountain system of southern and central Europe, extending from the sources of the Danube to Transylvania, and thus including the Hartz, which seems to have retained a trace of the ancient name. The term Hercynian forest was afterward restricted to the range which encircles Bohemia.

HERDER, JOHANN GOTTFRIED VON, one of the most comprehensive thinkers and versatile authors of Germany, born in Mohrungen, Aug. 25, 1744, died in Weimar, Dec. 18, 1803. He was the son of a schoolmaster and chorister, who allowed him in childhood to read only his Bible and hymn book. His reserved and pensive habits attracted the notice of a clergyman named Trescho, whose amanuensis he became, and under whom he made wonderful progress in study and various reading. At the age of 18 his philosophical and literary erudition gained him the friendship of a Russian physician, who sent him to Königsberg, whence he was to go to St. Petersburg as a lecturer on surgery. He, however, renounced his intended profession after witnessing a single operation, devoted himself to theology, and under the influence especially of Kant and Hamann extended his knowledge, with the greatest diligence and zeal, in the whole domain of art, science, literature, and history. In 1765 he became a preacher at Riga, and, previously noted for an almost misanthropic silence and gravity, the fervor and power of his discourses quickly made him an object of general enthusiasm. His *Fragmente über die neuere deutsche Literatur* (1767), and his *Kritische Wälder* (1769), were manifestoes against the artificial spirit and literature of his age, as compared with the grander inspirations of the early Orient and of ancient Greece. In 1769 he resigned his pastorate and an office of instructor which he held in connection with it, in order to travel in Germany, France, and Italy. At Strasbourg he was intimately associated with Goethe, who acknowledges the magical influence which his writings exerted on him. In 1771 he was called as court preacher to Bückeberg, where he remained till in 1776 he received the appointments of court preacher and member of the consistory at Weimar. By his *Älteste Urkunde des menschlichen Geschlechts* (1774) he had already given a new impulse to theology by seeking poetic sentiments in religious traditions, and by tracing in the primitive world the sublime instincts of human nature and the fore-shadowings of human destiny. At Weimar he

passed the remainder of his life, in association with the leading minds in that most brilliant period of German literature, and occupied with constant labors in theology, poetry, and history. As a theologian he coöperated with Lessing in opposing the despotism of the letter and of dogmas, and brought the instincts of piety and of poetic fancy, illustrated by a wide erudition, rather than the dialectics of the schools, to bear upon the questions of religion. This tendency appears in his *Geist der Hebräischen Poesie* (Dessau, 1782; translated into English by Dr. James Marsh, 2 vols., Burlington, 1833), in which he treats the Hebrew writings as productions at once of primitive poetry and of religious inspiration. "Herder is one of the new race of theologians," said Schläzer, "one of the witty, gallant gentlemen, to whom popular songs, which are heard in the streets and fish markets, are as interesting as dogmatics." Along with his own lyrical poems, he translated many legends and songs from Arabian, Indian, Italian, Spanish, and ancient German poets, among which were the Spanish romances of the Cid. While English, French, or Greek tendencies were pervading German literature, he exerted a cosmopolitan influence by a recognition of the poetry of all times and peoples, and especially a Christian and national influence by showing the peculiar beauties of the old Hebrew and the mediæval German poems. His most important work is the unfinished *Ideen zur Philosophie der Geschichte der Menschheit* (4 vols., Riga, 1784-'91); translated into English by T. Churchill, under the title of "Outlines of a Philosophy of the History of Man," (8vo., London), which is one of the principal and standard treatises on the subject. He traces the course of humanity as of an individual placed on the earth by an unseen hand, changing its forms and objects as it passes from country to country and from age to age, protesting everywhere against the finite world which enchains it, seeking the triumph of the infinite, the victory of the soul, tending in spite of détours and through a series of revolutions to civilization, and preparing for the blossoming of life in another world. His numerous writings were collected in 45 vols. (Stuttgart, 1806-'20), and in 60 vols. (Stuttgart, 1827-'30). A monument with the inscription *Licht, Liebe, Leben*, was erected to his memory by Charles Augustus at Weimar in 1819. His biography by his son E. G. von Herder appeared at Erlangen (6 vols., 1846-'7). N. L. Frothingham has translated some of his poems into English.

HEREDITAMENTS, in law, whatever may be inherited. This meant, strictly and formerly, only real estate, or land and things affixed to the land; but it now seems to be extended over some personals. (See HEIR.)

HEREFORD, a parliamentary and municipal borough and episcopal city of England, capital of Herefordshire, on the N. bank of the Wye, here crossed by a bridge of 6 arches, distant by the Great Western railway and its branches 136

m. from London, 109½ from Liverpool, and 49 from Bristol; pop. in 1851, 12,108. The principal building is the cathedral, refounded in 1079, and now (1859) in process of restoration, of early Norman architecture, cruciform in shape, with a frontage of 325 and a breadth of 110 feet. The west front fell in 1786, and was rebuilt in an incongruous style which destroys the effect. It possesses many fine monuments, some as old as the 11th century, and has attached to it a chapter house, Lady chapel, cloisters, and a library containing valuable MSS., among them Wycliffe's Bible, also a map of the world, supposed to be one of the oldest in existence. Hereford is noted for its ancient charities, among which are 11 hospitals, or almshouses, which distribute money and bread. The manufactures are not important; they consist of gloves, once the staple industry, hats, flannels, leather, and cutlery. Iron works have been established since the opening of the railroad to the coal district. Six fairs are held annually, the October fair being the largest in England for cattle and cheese. A musical festival is given triennially, in the cathedral, by the united choirs of Hereford, Worcester, and Gloucester. Hereford retains several of its ancient privileges, among which is the right to send 2 members to parliament.

HEREFORDSHIRE, an inland county of England, on the S. E. border of Wales, almost circular in shape; area, 836 sq. m.; pop. in 1851, 115,489. Its surface is diversified by hill and dale. It belongs wholly to the basin of the Severn, and has a gentle slope S. to that river, into which flow its streams the Leddon, Lugg, Teine, Dover, Munnow, Arrow, Frome, and Wye, the latter traversing the whole width of the county and famous for its beautiful scenery. Canals connect the towns of Hereford and Leominster with the Severn. The geological formation is old red sandstone, excepting in detached localities, where it is limestone. Iron ore, red and yellow ochres, pipe clay, and fullers' earth are found. Some medicinal and petrifying springs exist. This county formerly bore the name of "the garden of England." It is essentially agricultural, possessing neither manufactures nor trade. The soil is a deep, heavy, red loam, resting on clay or gravel, and very fertile. Within a few years the system of agriculture has been much improved. Wheat, barley, fruit, hops, and oak bark are the principal productions. The Hereford breed of cattle is famous for gentleness, beauty of appearance, and aptitude to fatten. The county returns 3 members to parliament, exclusive of 2 from the city of Hereford and 2 from the borough of Leominster.

HERESY (Gr. *αἵρεσις*, choice), in its original form, signified simply a choice or election, or in a more extended sense, a doctrine, a party, or school; and the term did not become reproachful until the Christian church classed with unbelievers all those who dissented from, or in any way sought to modify, its dogmas. Thus at first

any school of philosophy, as the Peripatetics, any sect, as that of the Sadducees or the Pharisees, or any religion, as for instance Christianity itself, was designated as a heresy; but this was modified at an early date, since in the only passage in the New Testament where the word heretic occurs it is used as a term of reproach (Tit. iii. 10). Adherents of a schismatic sect, or those who hold or teach doctrines contrary to the established religious faith, are heretics. According to Bossuet, a heretic is one who follows his own independent views, as contradistinguished from "a Catholic who follows without hesitation the opinion of the universal church." From a historical point of view, it appears that in every religion different social conditions have produced sects bearing a certain mutual likeness, and tolerated by each other. In addition to these, there are usually certain other sects or individuals whose views are disowned by the rest, and to these the terms heresy and heretic are peculiarly applicable. The earlier religious previous to Christianity, following each the wonted laws of social development, had in due time their heresies, which either rose to the dignity of reformatory movements, floated on a level as schisms, or sank into obscure sects. Thus Buddhism grew from Brahminism, developed several sects more or less strict, and finally its complete heresies, disowned by all the sects and by their councils. (See *BUDDHISM*.) Judaism and Mohammedanism have in turn obeyed the same law, and found it necessary at times to suppress such modifications of the primitive faith as were introduced either by independent thinkers from within, or by the influence of other religions without. The early history of Judaism in the Bible is that of a continued series of subversions of the faith by old Phœnician sensual heresies, and a vigorous casting of them out by energetic prophets or kings who knew them to be incompatible with a national existence. In no other religion, however, are the different phases of thought which produce heresy so distinctly marked as in Christianity, neither have they occurred in any other in so great a variety. Among the early Christians were many who joined the new faith out of opposition to the old Roman system, yet could not bring themselves to give up peculiar oriental doctrines, Jewish traditions, or tenets of Greek philosophy. Some were still impressed by the moral precepts of the mysteries or the rites of the orgies, and they endeavored to blend these with Christianity. Gnosticism, which in its extremes insisted on excessive asceticism or sanctified excessive licentiousness, gave birth to many heresies, as did the old Persian doctrine of dualism from which it borrowed, and which was a fertile source of outlawed schism in all ages. Apart from the faith in asceticism or love of pleasure which these sects favored, it must be borne in mind that their adherents were extremely addicted to those philosophical subtleties so characteristic of the oriental mind,

and that this disposition to establish a religion unsuited to the plain capacity of the many has been common to gnostically derived sects down to the present day. Among their earliest appearances we note the Nicolaitans, mentioned in the New Testament, and the Cerinthians, followed in the 2d century by the Basilidians, Pseudo-Basilidians, Carpocratians, the Valentinians, Nazareans, Ophites, Artemonians, Hermogenians, Montanists or Cataphrygians, Sethites, Prodicians, Antitactes, Quartodecimans, Cerdonians, Millenarians or Chiliasts, Manichæans, Alogians, Eneratites or Tatianists, Artotyrites, and Angelics. In the 3d century arose the Monarchians or Patripassians, Samosatensians, Paulinians, Arabici, Hieracites, Noetians, Sabellians, Novatians, Origenians, Melchisedechians, and Aquarians. In the 4th century came the very powerful sect of Arians, and with it others who analyzed closely the nature of Divinity or tenets distinctive of the Catholic church, such as the Apollinarians, Colluthians, Photinians, Macedonians, Priscillianists, Donatists, Euchites, the Collyridians, Seleucians, Antitropomorphites, Jovinians, and Bonosians or Adoptianists. We also find in the 5th century heresies springing up which advocated the germs of doctrines that in later years characterized important Protestant sects; such were the Pelagians and Predestinarians. In the same age came the Nestorians, Eutychians, Monophysites, Jacobites, and Theopaschites. In the 6th century arose the Agnoëtæ, Tritheists, Monothelites, and Aphthardocetes or Incorruptibles. In the 7th century arose the Guosinachi and Lampetians; in the 8th, the Agonychites; in the 9th, the Berengarians, Simoniacs, and Vecilians; in the 10th, the Paulicians; in the 11th, the Azymites; in the 12th, the Bogomiles, and with them continued through the middle ages the Catharists, the Petrobrusians, the Waldenses, Fratricelli, Beguins, Mystics, Wycliffites, Hussites, and a great number of minor sects, such as the Cagots in France, all of which merely reproduced, enlarged, or purified the views held by earlier heretics. Bearing in mind the true meaning of the word heresy, we observe that at this period several of what had been at one period highly respectable schisms, or even religions, now sunk into persecuted heresies, afterward reappearing as sects during the license of the reformation. Through the middle ages there existed in all parts of Europe great numbers of Manichæans, who in their highest grades preserved the nature worship taught in the mysteries from early antiquity. Many among them, as Neander remarks, adopted the current church terminology, giving it another and a mystical sense. This had already been done in the 7th century by a portion of the sect of the Paulicians, who as Hase states adhered to Gnostic doctrines and who considered it right to adopt the doctrines of the church, but with an allegorical signification, and to submit to the external forms of its worship for the sake of expediency. The entire symbolism of the art and ar-

chitecture of the middle ages, only of late beginning to be understood, shows a vast amount of Manichæan or Gnostic emblems, ingeniously contrived so as to bear either an orthodox church interpretation or a secret and entirely different oriental one. The extraordinary popular tumults which broke out through the middle ages from time to time, especially during the crusades, the evident independence of the knights templars, the daring views of scholars, the many peculiar customs which now seem absurd, were generally based on this cryptic heresy. The southern Slavic nations, Bulgarian and Bohemian, were especially under Gnostic influence. A portion of the early Taborites evidently clung closely to the most esoteric doctrines of this great body of secret heresy. They reappeared in Germany with the Anabaptists of Münster, and exist at the present day in a remarkably primitive form in several sects in Russia.—The punishments inflicted on heretics formed in earlier ages a very important branch of secular law. With the early Christians, punishment for heresy was limited to excommunication; but when Christianity became the religion of the state, the extreme of suffering was awarded them. In 385 Priscillian was condemned to death as a heretic. But it was not until the pontificate of Gregory VII., in the 11th century, that extensive punishment began. Not unfrequently political hatred and the spirit of local and ancient feud embittered these religious differences and led to terrible results, as in the case of the massacre of St. Bartholomew. Expediency in measures of state often induced kings and princes to persecute heretics as people endangering their power, and this was carried so far that popes more than once requested sovereigns to avoid excessive cruelty. Again it was done, as in the introduction of the inquisition by Ferdinand and Isabella into Spain, for the sake of strengthening the civil power. The Protestant bodies had in turn their heretics, as is illustrated by the burning of Servetus, and in the act of parliament passed during the first year of Elizabeth enabling persons to try heretics, and giving directions for their guidance. The ancient Christian church made a distinction between heretics who contumaciously resisted the admonitions of the church, and such as never had any admonition given them, none being formally regarded or treated as heretics until the church had given them a first and second admonition, according to the apostolic rule. The states of Germany have generally been but little inclined to inflict death for heresy. The first inquisitor in that country, Conrad of Marburg, caused much suffering in the Palatinate from 1214 to 1233; but there were never so many executed in Germany for heresy as in the west and south of Europe. The history of heretical sects, like that of political parties, is that of a succession of weaker faiths or principles growing into strength and eventually tolerated or adopted by the world. Of late years prosecutions for heresy have been of compara-

tively rare occurrence.—See Pinchinat, *Dictionnaire chronologique, historique et critique sur l'origine de l'idolâtrie des sectes, des Samaritains, des Juifs, des hérésies, &c.* (Paris, 1736).

HERING, CONSTANTIN, a German physician and writer on medicine, born in Oschatz, Saxony, Jan. 1, 1800. He studied medicine in Leipsic, Dresden, and elsewhere in Germany, and in 1826 received the degree of doctor of medicine, surgery, and obstetrics. Subsequently he was sent on a scientific expedition to Dutch Guiana. In 1834 he established himself in Philadelphia, where he has since for the most part resided. He has been connected with several medical reviews and journals of the homœopathic school, and is the author of a number of works devoted to the therapeutical reform commenced by Hahnemann, including "Rise and Progress of Homœopathy" (Philadelphia, 1834), which has been translated into several languages; the "Domestic Physician" (6th ed., Philadelphia, 1858), which has a circulation of upward of 50,000 copies in Europe and America; "American Drug Proverbs" (vol. i., Leipsic, 1853), &c. He has given much attention to the subject of cures for the bites of venomous reptiles or mad dogs, and in 1848 proposed the application of powdered sulphur between the soles of the feet and the stockings as a preventive of the Asiatic cholera, his theory being that the sulphur was absorbed through the pores of the skin, without disturbing the intestines, and exhaled as sulphuretted hydrogen.

HERIOT, GEORGE, the founder of Heriot's hospital, born in Gladsmuir, Haddingtonshire, in June, 1563, died in London, Feb. 12, 1624. In 1597 he was appointed goldsmith to Anne of Denmark, consort to James VI., and in 1601 to the king also. The goldsmiths of that day acted as bankers, and, in their dealings with royal and noble personages, lent them money on interest, as well as supplied them with jewels. When James VI. came to the English throne as James I., he was accompanied to London by Heriot as his goldsmith, who during his subsequent residence in that city acquired a very large fortune. He had been twice married, but had lost his two sons by his first wife, and had no issue by the second; and when declining health and years led him to think of disposing of his large estate, he resolved to devote a very considerable portion of it to a work of charity. He accordingly made his will in 1623, giving to the magistrates and clergy of Edinburgh, as trustees, about £24,000 for the founding of a hospital there, for the "maintenance, relief, bringing up, and education of poor and fatherless boys, freemen's sons of the city." A considerable part of the money was invested in lands and buildings; and the hospital edifice, owing partly no doubt to the civil wars, was long in progress of erection. It was designed by Inigo Jones from the plans of Dr. Balcanqual, dean of Rochester, one of the executors, but neither planner nor architect lived to see it completed. When partially finished, it was occupied for several years by Cromwell as

a barrack for his troops. The building was finally completed at a cost of about £44,000, and the establishment opened in 1659. It is a fine edifice 162 feet square, with a quadrangle 94 feet square enclosed. Provision was made for the support of 180 boys, between the ages of 7 and 14, who are maintained in the school 4 years; at the end of that time, if they give evidence of superior abilities, they are retained till fitted for college, and allowed the sum of £30 a year, during the 4 years of their collegiate course. If they do not desire a collegiate education they are apprenticed, and receive £10 a year for 5 years, a Bible, and 2 suits of clothes, and at the end of their apprenticeship £5 more. There are also 10 bursaries open for competition to those who are not connected with the hospital, but who desire to acquire an education. Each of these bursaries is of the value of £20 a year for 4 years. In 1836 the funds of the hospital had accumulated to such an extent that the trustees applied to parliament for an act to permit them to use the surplus in the establishment of free schools in that city for the children of poor citizens. The permission was granted, and 12 schools have been established, giving free instruction to 3,000 children. In Scott's novel "The Fortunes of Nigel," George Heriot is introduced as one of the principal characters.

HERKIMER, a N. E. co. of New York, intersected by the Mohawk river, and also drained by several mill streams; area, 1,745 sq. m.; pop. in 1855, 38,566. It has a hilly surface, in many places covered with a dense growth of timber. It contains limestone, building stone, lead, and gypsum. The soil is very fertile in the valleys, and even in some of the hilly districts. The productions in 1855 were 283,748 bushels of Indian corn, 44,053 of wheat, 724,855 of oats, 257,875 of potatoes, 78,255 tons of hay, 1,305,377 lbs. of butter, and 9,068,519 of cheese. There were 18 grist mills, 94 saw mills, 4 furnaces, 5 machine shops, 2 carding and fulling mills, 3 cotton factories, 3 woollen factories, 5 paper mills, 21 tanneries, 6 newspaper offices, 201 school houses, and 85 churches. The Erie canal, the New York central railroad, and the route of a proposed railroad from Saratoga to Sackett's Harbor, pass through the county. Capital, Herkimer.

HERMANN. See ARMINUS.

HERMANN, JOHANN GOTTFRIED JAKOB, a German philologist, born in Leipsic, Nov. 28, 1772, died Dec. 13, 1848. He early showed great talent for the acquisition of languages. After studying law at Leipsic and Jena, he began to lecture on ancient literature at Leipsic in 1794, and in 1798 was appointed professor extraordinary. In 1803 he became professor of eloquence, and in 1809 of poetry. His acquirements and judgment in philology, philosophy, and history were such as to soon render him eminent. His lectures on Greek were a school of grammatical and critical philology which furnished many eminent teachers to the world. His numerous editions of Greek poets and his disputes with

J. H. Voss and Creuzer have made Hermann well known to the literary world.

HERMANNSTADT (Hung. *Nagy Szeben*), a town of Transylvania, capital of a district comprising the greatest part of the so called land of the Saxons, on the Zibin, 60 m. W. from Cronstadt; pop. about 20,000. It consists of an upper and a lower town, and is surrounded by a wall with 5 gates. The principal public edifices are the churches, the most prominent of which is the Lutheran cathedral, a palace, gymnasium, barracks, hospital, theatre, town hall, and government offices. The palace contains a picture gallery, a library of 15,000 volumes, and a museum of Roman antiquities. The ramparts have been converted into handsome promenades, whence there is a fine prospect of the adjacent scenery. There are considerable manufactures of linen and woollen, pottery, &c. Hermannstadt is the seat of the governor of Transylvania, and of a Greek bishop. It was founded in the 12th century by a German colony. In the course of the 15th and 16th centuries it was often besieged by the Turks, and was taken by them in 1536. At the beginning of the 17th century it was subjected to great calamities by Gabriel Batori. Several battles between the Austrians and the Hungarians were fought there at the beginning of 1849, in which Bem was the commander of the Hungarian troops. In the early days of March the town was occupied by the Russians, but taken by Bem, March 11. A conflict between the Russians and Hungarians on July 20 resulted in the occupation of the town by the former on the following day, but finally (Aug. 4, 1849) the Hungarians reconquered the town under Bem.

HERMAPHRODITE (Gr. *Ἑρμης*, Mercury, and *Ἀφροδιτη*, Venus), an animal or plant uniting in itself the sexual characters of the male and female. The name is derived from the fable of the union into one of the bodies of Hermaphroditus, son of Mercury and Venus, and the nymph Salmacis. There are two kinds of hermaphroditism, the spurious and the true; in the former there is only an appearance, from arrest or excess of development, of a union of opposite sexual characters; in the latter there is an actual coexistence in the same individual of more or less of both male and female organs; the former may occur in either sex, and in the latter the male or the female may preponderate. This condition is often complicated with other anomalies of structure and character, which approximate the female still more to the male in appearance; this kind of malformation has been often noticed in monkeys and in the lower mammals. True hermaphroditism is the normal type of sexual structure in almost all phanerogamic plants, the reproductive organs being either upon the same flower or upon different flowers on the same individual; and this condition is sometimes found as a monstrosity in dioecious plants. Perfect hermaphroditism exists also normally in many invertebrate animals, as, according to Siebold, in the *ctenophora* among

acelephæ; the *cestodes* (tapeworms) and *trematodes* among *helminthes*; *planaria*; *hirudinei* (leeches) and *lumbrieini* (earth worms) among annelids; some acephalous and cephaloporous mollusks; cirripeds among crustaceans; and the *tardigrada* among arachnoids. It does not exist in insects, unless as a monstrosity. In some of these, as in the *trematodes* and *planaria*, each individual may be self-impregnating, but generally the sexual act is accomplished by 2 individuals, respectively impregnating each other.

HERMENEUTICS (Gr. *ἑρμηνεύς*, an interpreter), the science treating of the principles and method whereby the meaning which a writer intended to convey in any work or passage may be found and explained. It treats not only of the general use of language, but of the usages peculiar to each writer, and the ideas, opinions, and modes of thought which belong to the author and to his age. The term is particularly applied to biblical exegesis.—See Rosenmüller, *Historia Interpretationis Librorum Sacrorum* (1795–1812); and Reuss, *Geschichte der heiligen Schrift des Neuen Testaments* (2d ed., 1853).

HERMES. See MERCURY.

HERMES, GEORG, a German theologian, born in Dreyerwalde, Westphalia, April 22, 1775, died in Bonn, May 26, 1831. From 1792 to 1798 he studied theology at the university of Münster. In 1792 he became teacher in the gymnasium of that city, and in 1807 professor of positive divinity at Münster. While at the university he had closely studied Kant's philosophy, and endeavored at Münster to construct a system on the principles of that philosopher. When the Prussian government established the university of Bonn, Hermes was appointed to the chair of Catholic theology. Here he began to distinguish himself by endeavoring to found a speculative philosophic and dogmatic school in the church itself, delivering a course of lectures which caused great sensation by aiming at an alliance between Protestants and Catholics, insisting that the difference between their views was not so great as is popularly supposed. He attempted to base the *Dogmatik* or positive theology of the Catholic church on speculative philosophy, founding a doctrine known as Hermesianism, and drew around him great numbers of followers. Many of these in time filled chairs of theology in the Prussian states, and set forth their views, in common with their master, in a magazine first published at Cologne in 1832. The philosophico-dogmatic method which Hermes advocated, as propounded in an "Introduction to the Catholic Christian Theology," insisted that the truth of Christian revelation and of the Catholic church should first be tested by reason, and that revelation should then be followed. He did not go so far as to insist that all the dogmas in themselves could be proved *a priori*, but merely to found the right of the church to teach them on the ground of reason, and thereby strengthen faith in it. Hermesianism was in fact a most ingenious

effort to base the doctrines of the church on Kant's system of philosophy. It avoked powerful opposition, being condemned as heretical by a papal letter of Sept. 26, 1835; in consequence of which Drosté von Vischering, archbishop of Cologne, proceeded against it with great severity. The Hermesians defended their orthodoxy vigorously; Braun, Achterfeld, Rosenbaum, and many others appealing to the pope, but without success.

HERMES TRISMEGISTUS, a mythical person, the reputed author of a great variety of works that were probably written by Egyptian Neo-Platonists. The Egyptian god Thoth (the intellect) was identified by the Greeks with Hermes (Mercury) as early as the time of Plato. In the conflict between Neo-Platonism and Christianity, the former sought to give a profounder and more spiritual meaning to the pagan philosophy, by combining the wisdom of the Egyptians and the Greeks, and representing it as a very ancient divine revelation. They therefore ascribed the authorship of the highest attainments of the human mind to Thoth or the Egyptian Hermes, regarded him as the source of all knowledge and inventions, the embodied Logos, thrice greatest (*τρίς μέγιστος*), from whose thoughts inscribed upon pillars Pythagoras and Plato had derived their ideas, and whose works contained the sum total of human and divine wisdom. Clement of Alexandria mentions the contents of 42 books of Hermes which were extant in his time. Of those which now remain, some seem to have proceeded from the school of Philo, and others are much later and not unaffected by Christianity; some are written in a sober philosophical spirit, and others abound in fantastic astrological and thaumaturgical speculations. The most important is the *Pemander*, a dialogue on nature, the creation, the Deity, the soul, knowledge, and similar topics, and interesting as showing the extent to which the combination of Platonic, Christian, oriental, and Jewish notions was carried in the age in which the eclectic scheme of comprehension was founded by Ammonius.

HERMIT. See **ANCHORETS**.

HERMITAGE WINE, the appellation of various kinds of French wine produced on the left bank of the Rhone, near Tain, in the department of Drome. The name is derived from the granitic mountain called l'Ermitage or l'Hermitage. The whole extent of the vineyard, though divided among many proprietors, hardly exceeds 300 acres, of which only a part near the centre of the mountain produces first-rate red and white wines. The former are superior to the latter, and some of them, as the Méal and Greffieux, are thought to be equal to the best claret and Burgundy. The Baume, Bessas, and Raucoule qualities rank next in excellence. The best red Hermitage wines are distinguished by a dark red color, an exquisite flavor, and a taste of strawberries. Their excellence is only fully developed after having been in bottles for several

years. The grape grown for red wine (*ceras*) is supposed to have been brought from Shiraz.

HERMON, a mountain of the Holy Land, often spoken of in the Bible, forming the S. E. part of the Anti-Libanus. The Bible speaks of the "dew of Hermon;" and travellers tell us that this is so abundant that their tents are wet with it, as if by a steady rain. Moses applies to this range the names of both Hermon and Sion, mentioning also its Emoritic name Senir, and the Moabitic Sirion.

HERMOPOLIS MAGNA, an ancient city of Egypt. See **OSIMOXYEN**.

HERMOSILLO, the principal city in the state of Sonora, Mexico, situated on a river of the same name, 30 Mexican leagues from the Californian gulf, and 36 N. from the port of Guaymas; pop. in 1840, 13,665, including 2,000 Yaqui Indians, who are the laborers of the town, and dependent upon it; in 1859 estimated at 17,000. It has a large trade with Guaymas, being the principal entrepot for the trade with the interior. The climate is dry and exceedingly hot, the mercury ranging during the day from 95° to 100° F. Notwithstanding this, the place is considered healthy, being free from the epidemics which often accompany such high temperatures. The town lies in a valley about 10 m. in length by 4 in width. It is closely hemmed in on the east by a mountain or rugged hill of rocks composed of crystallized carbonate of lime. The houses are well built of stone and adobe, the better ones being plastered and colored with good taste. The valley produces annually about 65,000 bushels of wheat, 26,000 of maize, and 12,000 of other cereals. Vegetables are not cultivated to any extent; onions, sweet potatoes, chili, and pumpkins constituting the entire supply. Of fruits there is a great abundance, including grapes, melons, figs, oranges, limes, lemons, citron, peaches, and pomegranates. But the vine is most extensively cultivated, not less than 1,500 barrels of brandy being annually made. Hermosillo is the ancient presidio of Pitic, which belonged to the company of Horcasitas.

HERNDON, **WILLIAM LEWIS**, an American naval officer, born in Fredericksburg, Va., Oct. 25, 1813, drowned by the sinking of the steamer Central America, Sept. 12, 1857. He entered the navy at the age of 15, served in the Mexican war, and was engaged for three years with his brother-in-law, Lieut. Maury, in the national observatory at Washington. In 1851-'2 he explored the Amazon river under the direction of the U. S. government. The route selected by him was from Lima across the Cordillera in an E. direction, as far as Tarma, and thence N. to Tingo Maria on the Huallaga, a Peruvian tributary of the Amazon. From this point he obtained canoe navigation, and after 700 miles of travel the great stream was reached. During a portion of the journey he was accompanied by Lieut. Lardner Gibbon; but they separated at Tarma, the latter undertaking the task of exploring the Bolivian territories, and Herndon the

head waters and main stream of the Amazon. A narrative of the expedition is contained in Hern-
don's "Exploration of the valley of the River
Amazon," with map and plates (Washington,
1853), and in part II. of the same work by
Lieut. Gibbon, with illustrations and maps
(Washington, 1854). In 1857 he was com-
mander of the steamer Central America, which
left Havana for New York on Sept. 8, having on
board 474 passengers and a crew of 105, and
about \$2,000,000 of gold. On Sept. 11, during
a violent gale from the N. E. and a heavy sea,
she sprung a leak, and sunk on the evening
of Sept. 12, near the outer edge of the Gulf
stream, in lat 31° 44' N. Only 152 of the per-
sons on board were saved, including the women
and children; the gallant commander of the
steamer was seen standing upon the wheel
house at the time of her sinking.

HERNIA, or RUPTURE, the protrusion of any
organ outside of its natural enclosing cavity,
but, in common language, limited to the escape
of the abdominal viscera. Until about the 18th
century this disease was neglected by the profes-
sion, and its treatment was principally in the
hands of itinerant quacks; but since then it has
received the attention of the most eminent sur-
geons of all countries. According to the seat
of the protrusion, the principal kinds of hernia
are: the inguinal, which comes out at the ab-
dominal rings, following the course of the
spermatic cord in the male and of the round
ligament in the female respectively into the
scrotum and the greater labia; the femoral or
crural, passing beneath Poupart's ligament, and
forming a tumor on the inner and upper part of
the thigh; umbilical, in which the protrusion
takes place at the navel or fetal opening of the
umbilical cord; ventral, at the openings in the
linea alba or *lineæ semilunares*; diaphragmatic,
in which the abdominal organs pass into the
cavity of the chest through some natural or
abnormal opening in the diaphragm. All the
abdominal viscera, except the duodenum, pan-
creas, and kidneys, may form part of the con-
tents of a hernial tumor; but the floating por-
tions of the small intestines (*jejunum* and *ileum*),
the omentum, and the arch of the colon, are
their most frequent constituents. Hernia rarely
protrudes on the posterior and lateral portions
of the abdomen, which are protected by thick
muscles and firm unperforated aponeuroses, and
where the organs are of large size and but lit-
tle movable; the anterior abdominal wall, on
the contrary, is thin, extensible, having weak
points in the inguinal rings and canals, and
freely floating organs always pressing upon its
yielding tissues. A hernia is said to be re-
ducible, when it may be returned into the ab-
domen; irreducible, when not thus returnable;
and strangulated, when, owing to some con-
striction, it cannot be returned, and it inter-
feres with the circulation in the intestines and
the passage of their contents. The sac of a
hernia is a pouch of the reflected or parietal
layer of the peritoneum, which is pushed for-

ward in proportion to the escape of the viscera;
external to this are the layers of fascia, muscles,
and cellular tissues, varying in thickness accord-
ing to the situation of the tumor. When we
consider the yielding nature of the abdominal
walls, their liability to pressure from muscular
action, and the weak points inviting protrusion
of the viscera, it is not surprising that hernia
is so common; it has been estimated that
in the male sex at least one in five is affected
by it. The exciting causes are such as sud-
denly or violently compress the organs by ac-
tion of the abdominal muscles, such as great
bodily exertion, the lifting of heavy weights,
violent vomiting, coughing, and sneezing; long
continued efforts in parturition, defecation, or
micturition; habitual compression by corsets,
belts, bandages, and heavy hip-supported cloth-
ing; falls, improper gymnastic exercises and
feats of strength, severe blows and contusions.
A simple hernia, easily reducible and kept so by
a proper truss, is rather an annoying infirmity
than a positive disease, and is generally sus-
ceptible of a radical cure.—The treatment of re-
ducible hernia is to return it to the abdomen by
a process called the *taxis*, and to retain it in
place by a properly constructed and well fitting
truss. Great care is necessary in the preparation
of the truss; it should fit exactly, the springs
should have the right bearings and pressure,
and the pads the proper shape and consistency.
Hernia may be rendered irreducible by adhe-
sions of the sac to its contents, and of the lat-
ter to each other, or by enlargement of the
contained omentum from fatty deposition;
the treatment is merely palliative, except in
rare and favorable cases. Strangulated hernia
may be produced by a sudden protrusion
through a narrow aperture after violent exer-
tion, by swelling or spasmodic action about the
neck of the sac, distention of the intestine by
flatus or fæces, and swelling and congestion of
the omentum and mesentery; the stricture is
generally at the neck of the sac. The in-
dications of treatment are to reduce the her-
nial contents by the *taxis*, if possible, with the
assistance of relaxation of the muscles by posi-
tion, by bleeding, hot baths, narcotics, tobacco
enemata, cold applications, and antimonial pro-
stration, or, in modern times, by the inhalation
of sulphuric ether and chloroform; if these fail,
the sac must be cautiously opened, the stricture
divided by the knife, and the hernia returned.
Strangulated hernia is always a dangerous af-
fection, and frequently fatal either in itself
or from the effects of operations. Umbilical
hernia, most common in new-born children,
is treated on similar principles, by the re-
duction of the contents, and their retention
by a special bandage. Diaphragmatic hernia,
whether from congenital deficiency or acciden-
tal rupture of this partition, when strangulated,
is difficult of diagnosis, and beyond the reach of
operative surgery; ether would probably give
the best chance of relief by relaxing spasm.

HERNICI, an ancient people of central Italy,

often mentioned in the early history of Rome. They were of the Sabine race, and inhabited the Apennines of Latium between Lacus Fucinus (now Lake Celano) and the Trerus (Sacco), a tributary of the Liris (Garigliano). Their name is supposed to have signified "mountain-creeper." Their nearest neighbors were the Marsi, Æqui, and Volsci, whom they equalled in bravery, and like whom they obstinately resisted the growing power of Rome. In 486 B. C., however, they became the allies of the Romans, and 180 years later they were finally subdued by them. Anagnia (Anagni) was the chief town in their territory, near which Cicero had a beautiful estate.

HERNOSAND, or WESTER NORRLAND, an administrative province of Sweden, comprising the districts of Angermannland, Jemtland, and Medelpad; area, 9,650 sq. m.; pop. in 1855, 110,148. It is bounded N. by the province of Umea, W. by Östersund, S. by Gefle, and E. by the gulf of Bothnia. It contains several fertile valleys, with wooded hills, and is watered by numerous lakes and the rivers Angermann, Soda, Adals, Sanga, and Indal. Its towns are Hernosand, the capital, and Sundsvall. The former is a well built seaport of 2,200 inhabitants, on the W. side of the island of Hernön, at the mouth of the Angermann river. It carries on a considerable trade, and has a small provincial college, botanical garden, and an establishment for printing books in the Lapp language.

HERO. See HERON.

HERO, in Greek mythology, a priestess of Venus at Sestos, beloved by Leander, a native of Abydos. Leander used nightly to swim across the Hellespont to visit his mistress; but one tempestuous night he was drowned, and in the morning the billows cast his body on the shore. When Hero beheld the lifeless form of her lover, she threw herself into the sea.

HEROD, surnamed the Great, king of the Jews, son of Antipater, a noble Idumæan, born in Ascalon, Judæa, about 71 B. C., died in 4 B. C. When in 47 B. C. Julius Cæsar appointed his father procurator of Judæa, the young Herod obtained the government of Galilee. He quickly gave proof of his energy and talent by vanquishing the hordes of robbers which then infested the province. Alarming the ruling men at Jerusalem by his popularity, he was summoned before the sanhedrim on complaints of having put Jewish citizens to death without trial. On the appointed day he appeared before the tribunal, gorgeously clad in purple, and surrounded by armed men; and though his acquittal was pronounced, he departed secretly to Syria, and was appointed governor of Cœle-Syria in 46. After the death of Cæsar he favored Brutus and Cassius, and received the command of the army in Syria. He was equally successful in winning the support of Mark Antony, who entertained him at Rome in 40, and obtained from the senate a decree appointing him king of Judæa. After the bat-

tle of Actium (31 B. C.) and the death of Antony, he was confirmed in his kingdom by Augustus, whose favor he enjoyed during his reign. He had entered upon his government by besieging Jerusalem, and he hesitated at no crime or cruelty to establish his sovereignty. Hyrcanus, whom he feared as a competitor, was put to death on a charge of treason; his own wife Mariamne, to whom he was passionately attached, was executed; and her execution was followed by that of their two sons, and of her nearest relatives, and several of his principal counsellors. His administration was, however, vigorous and splendid, and Judæa was for 30 years undisturbed by war, though its forces aided the Romans in Arabia and on the Bosphorus. He erected a marble temple at Paneas in honor of Augustus, restored the city of Samaria under the name of Sebaste, transformed a small town on the coast into the magnificent city of Cæsarea, erected temples and theatres, and an amphitheatre without the walls of Jerusalem, in which the Roman combats with wild beasts and gladiators were exhibited, sought to conciliate his subjects by many acts of munificence and liberality, and began to rebuild the temple of Jerusalem. In 18 B. C. he visited Rome, and was received with the greatest distinction by Augustus. The latter part of his reign was harassed by conspiracies and intrigues, and it was in his last illness, while a fearful disease was consuming his stomach and intestines, that he must have ordered the murder of the children in Bethlehem. This event is recorded only by the evangelist (Matt. ii. 16), and, being confined to the neighborhood of a single village, may naturally have passed unnoticed by Josephus amid the many more general atrocities of his government. His death occurred in the year of the birth of Christ, that event being known to have taken place 4 years before the date in general use as the Christian era. Josephus is the principal authority for the events of his reign, which, notwithstanding its barbarities, restored to Jerusalem much of its earlier magnificence. He was married to no fewer than 10 wives, and by his will partitioned his kingdom between 3 of his sons, Archelaus, Philip, and Herod Antipas.

HEROD AGRIPPA I., king of Judæa and Chalcis, son of Aristobulus, and grandson of Herod the Great, born in the year 7 B. C., died A. D. 44. He was a favorite of his grandfather, who, after the death of his father, sent him to Rome where he was educated. Caligula gave him the tetrarchy of Judæa with the title of king. For services rendered, the emperor Claudius, after the banishment of Herod Antipas, gave him all the provinces of ancient Judæa and the kingdom of Chalcis, so that he became of a sudden one of the greatest princes of the East. He governed much to the satisfaction of the Jews, and probably from a desire of pleasing the fanatical party put to death the apostle James, and shut up Peter in prison. At Cæsarea, while giving games in honor of Claudius, the inhabitants of Tyre and Sidon waited on

him, desiring peace. Arrayed in royal apparel, he sat upon his throne and made an oration to them, and they glorified him as a god. He willingly received the impious flattery, but soon after died miserably (Acts xii.), after a reign of 7 years.

HEROD AGRIPPA II., son of the preceding, a Jewish prince, born A. D. 30, died in 100. When his father died, he was residing at the court of the emperor Claudius, who, instead of bestowing on him the dominions to which he was heir, detained him for 4 years at Rome. In A. D. 48 he received the small principality of Chalcis, to which additions were subsequently made. In 60 he went with his sister Berenice to Cæsarea to salute Festus on his accession to the government of Judæa, and St. Paul, a prisoner there, stated his case before him. Before the rebellion of the Jews from the Romans, he sought to reconcile them, and during the war he sided with the Romans. After the capture and destruction of Jerusalem he retired with Berenice to Rome.

HEROD ANTIPAS. See **ANTIPAS**.

HERODES ATTICUS. See **ATTICUS**.

HERODIAN, a Greek writer on Roman history, supposed to have lived between A. D. 170 and 240. Nothing is known of his life except that he resided for a long time in Italy. His work is entitled *Της μετα Μαρκον Βασιλείας Ἱστοριῶν Βιβλία οκτώ*, and contains the history of the 15 reigns between A. D. 180 and 238. His style is formed on that of Thucydides, and though his chronology and geography are sometimes inaccurate, his narrative is generally clear and impartial. The best editions are those of *Irmisch* (5 vols., 1789–1805), *F. A. Wolf* (1792), and *Bekker* (1826.)

HERODOTUS, a Greek historian, styled the father of history, born in Halicarnassus, a Doric colony in Asia Minor, in 484 B. C., died in Thurium, a Greek settlement in Italy, about 424. The statement of Suidas that he belonged to an illustrious family is confirmed by the indications of wealth furnished by his high education and abundant means for frequent and distant travel. It is probable that he continued to reside at Halicarnassus, making that the centre from which he undertook long journeys for historical and geographical inquiry, till about 447, when, having brought his history to a degree of completeness, he removed to Athens. There is no confirmation of the story of Suidas that he was forced to fly from Halicarnassus to Samos by the tyranny of Lygdamis, who put to death his relative, the epic poet Panyasis; that in Samos he adopted the Ionic dialect and wrote his history; and that he took the lead in an insurrection for the liberation of his native city. Had he thus been a tyrannicide, it is unlikely that the circumstance would have passed without mention by panegyrists, and his adoption of the Ionic dialect is sufficiently explained by the fact that that dialect was already employed for prose composition. His travels must have occupied many years, since he visited Babylon,

Ardericca near Susa, the remoter parts of Egypt, Cyrene, Colchis, Scythia, Thrace, Zante, Dodona, and Magna Græcia, thus ranging over a space more than 1,700 miles from E. to W. and 1,660 miles from N. to S. Within these limits his knowledge of scenery, cities, temples, manners and customs, and various wonders, is generally so minute and full that it could have been acquired only by a leisurely examination. In Egypt, for instance, he personally visited the great capitals Memphis and Heliopolis, the smaller towns, Sais, Bubastis, Buto, Paphremis, Chemmis, Crocodilopolis, and Elephantiné, the labyrinth, Lake Mæris, the line of the canal from the Arabian gulf to the Nile, the borders toward the desert of Sinai, and the whole region of the Delta. It is probable that his travels occupied only the earlier portion of his life, and that he devoted himself to seclusion, study, and composition when in his 38th year, he removed to Athens. It is related on uncertain authority that in 446 the Athenian assembly decreed a reward to him for his history, which he had read publicly; that he made known his work by recitation not only at Athens but in other cities, travelling from place to place as a sort of prose rhapsodist; and that at the recital of it before the collected Greeks at the great Olympian festival the young Thucydides was present and was moved to tears. Herodotus while at Athens was at least acquainted with Thucydides, Sophocles, and some of the other intellectual lights that distinguished the age of Pericles, and it was doubtless from association with them in the centre of literary Hellas that he received the impulse to that wonderful elaboration of his work which he carried on for 20 years after his departure. In 443 he joined the colonists whom Pericles was sending out to Italy, and became one of the first settlers at Thurium, with Hippodamus the architect of Piræus, Lysias the orator, then only in his 15th year, his brother Ptolemarchus, the friend of Socrates, and with others. From this time he applied himself only to the perfection of his history, retouching the narrative and interweaving parenthetical passages and accounts of later events. The abruptness of its close and occasional traces of incompleteness indicate that, notwithstanding he had been constantly improving it, it was not entirely finished at his death. Many critics believe that he composed also the separate treatise on Assyrian history to which he twice refers in his general history for fuller information, but which has not been preserved. The time and place of his death are not altogether certain, his life being prolonged according to some to 394, and Pella and Athens instead of Thurium being made his abode in his latest years. There were Greek historians in the century before Herodotus, called in general logographers or legend writers, though some of them treated not only the mythical period, but proper geographical and historical subjects. But though he is habitually minute in referring to his authorities, the only Greek historian

whom he quotes or whose works he seems to have consulted is Hecateus. He may have drawn to some extent from other writers, geographers and mythologists, yet he probably owed very little to the whole prose literature of his country, which was then in its infancy, and derived almost all his narratives and descriptions from personal observation and inquiry. The main subject of his history is the Persian war of invasion, the contest which began with the expedition of Mardonius and terminated with the discomfiture of Xerxes. He, however, not only relates as an introduction the growth of the Persian empire and the previous hostilities between Greece and Persia, but throughout the work takes every opportunity of diverging from his principal object in order to introduce his various historical, geographical, and antiquarian knowledge. Thus he interweaves accounts of Cræsus and of the Lydian kingdom, of the Babylonians and Assyrians, of the Egyptians, of the Greek colonies of northern Africa and the native Libyan races, of the Scythians and Hyperboreans, apropos of whom he gives an episode on universal geography. For the later and more important portion of his history abundant living testimony was easily accessible to him, beside which there were in most of the countries monumental records of antiquity, and oral traditions even in Scythia and Libya. Thus in Greece there were lists of the kings, priests, and victors at the games preserved in cities and sanctuaries, and dedicatory inscriptions on offerings in the temples; the Babylonians had sculptured documents, many of which have recently been discovered, tracing their history back with accuracy for 2,000 years; the monuments of the Egyptians reached to a still higher date; and in Persia there were not only memorials on pillars, tombs, and palaces, but more copious writings on parchment preserved in the archives of the empire. Herodotus was unable to read any language but his own, and was therefore in foreign countries dependent on his informants. These were in Egypt the priests, and they took advantage of his ignorance to magnify the antiquity of their nation by representing lists of monarchs as consecutive which were often contemporary, to conceal from him their dark period of subjection under the invading shepherd kings, and to modify other inglorious portions of their history. In Babylon he probably obtained but little of his information from the Chaldean priestly caste, who possessed the most exact and extensive knowledge; and though his accounts are correct in outline, they lack the fulness and precision of the narrative of the priest Berosus, who wrote more than a century later. Being born and bred up in a Greek city that was subject to Persia, he doubtless came frequently into contact with Persian soldiers and officials, and he seems to have had access also to some of the most important documents in the royal archives, perhaps by means of Greek transcripts. His Persian history is therefore

based in the main on authentic national records, diversified especially in the earlier part by circumstances and adventures from romantic chroniclers. Thus for the most important portions of his work Herodotus had monumental records of a trustworthy character, accessible to himself or his informants; and his diligence, honesty, and impartiality in employing the materials that were open to him, have been generally admitted. His chief defect as a historian is an undue love of the marvellous, leading him to give accounts of strange and astonishing manners, surprising phenomena of nature, and singular productions and animals, which the progress of knowledge has shown to be untrue, and sometimes to repeat narratives of real events, as he received them, with vast exaggeration. This is partly explained by the fact that his rule was not to reject a report if he did not believe it, but to record whatever he heard of countries and events of which the Greeks knew little or nothing. Without this tendency he would not have imparted many valuable though partially fabulous accounts, in which recent inquirers have discovered substantial truth; and his truthfulness and accuracy whenever he speaks from his own observation have been universally admired by modern travellers. The skill with which he has interwoven his episodes, and the pervading idea of a divine Nemesis which he constantly presents, gives to his history the unity essential to a work of art. The peculiarity of his theory of divine retribution is that he regards mere greatness and good fortune, apart from any impiety or arrogance, as provoking the envy of the gods (*φθονος των θεων*). This theory was the great moral which he had drawn from his survey of mundane events; and perhaps the chief attraction of his main theme, and the principle which guided him in his choice of episodes, was that he might present signal illustrations of greatness laid low, of monarchs and patriots who gradually rose to the pinnacle of glory and prosperity only to experience a most calamitous reverse. The simple beauty of his style, the grandeur of his historical combinations, the amiability of his temper, and the entertainment which his narrative furnishes, have never been questioned, and he is esteemed by scholars the earliest and best of romantic historians.—The best editions are those of Schweighäuser (6 vols., Strasbourg and Paris, 1806; reprinted in London, 1818), Gaisford (4 vols., Oxford, 1824), and Bähr (4 vols., Leipsic, 1830 *et seq.*). The best English translation is that of the Rev. G. Rawlinson, assisted by Sir Henry Rawlinson and Sir J. G. Wilkinson (4 vols., London, 1858 *et seq.*; New York, 1859 *et seq.*), with copious notes and appendices embodying the chief historical and ethnographical illustrations that have been obtained in the progress of cuneiform and hieroglyphical discovery.

HEROES, or DEMIGODS, in Greek mythology, persons forming an intermediate link between men and gods. In the Homeric poems they

appear as the sons of gods, and as another and higher race than men, who are born of the earth, from stones and trees. They were more powerful, beautiful, courageous, and in every respect more excellent than men, with whom as with the gods they associated intimately. They were the early national heroes, kings, lawgivers, founders of cities, conquerors in battle, leaders of adventurers, and original heads of all royal and noble houses. In Hesiod they are represented as the fourth created race, the successors of the golden, silver, and brazen races, and the precursors of that of iron. They were a splendid stock, the chiefs who performed the exploits at the sieges of Troy and Thebes; but they soon became extinct, some perishing in war, others being transferred by Jupiter to a happier state in the isles of the blessed, where they reaped thrice in a year the spontaneous fruits of the earth. Hesiod doubtless introduced the divine race of heroes between that of brass and that of iron only to give a place to the champions at Thebes and Troy in immediate contiguity with the present iron race, the noblest members of which were of heroic descent. The heroic or anti-historical age of Greece extended to the return of the victors from Troy, and of the Doric Heraclidæ into the Peloponnesus. Of the various legends concerning it, some sprang from and were peculiar to particular places, as those of the Lapithæ and centaurs in Thessaly; of Cadmus and Amphion in Thebes; of Io, Danaus, and Perseus in Argos; of Sisyphus, Bellerophon, and Glaucus in Corinth; of the Dioscuri in Laconia and Messenia; of Europa, Minos, and the Minotaur in Crete; and of Cecrops, Proene and Philomela, Cephalus and Procris, Erechtheus, Ion, and Pandion in Attica. The general Hellenic heroic legends were those of Heracles and the Heraclidæ, Theseus, Meleager, the Argonauts, the Theban cycle of Œdipus, the seven against Thebes, the Epigoni, and Alcæon, and the Trojan cycle of the Pelopidæ, Æacidæ, Atridæ, Diomedæ, and Ulysses. To these may be added the myths of the prophetic heroes Melampus, Amphiaraus, Polyidus, Mopsus, Tiresias, and Calchas; of the musical heroes Orpheus, Thamyris, Linus, Hymenæus, Jalemus, Musæus, Eumolpus, and even Homer and Hesiod; and of the artistic heroes Dædalus, Trophonius, and Agamedes.

HEROIC VERSE, the measure of epic or heroic poetry, being in Greek and Latin the hexameter, in Italian, English, and German the iambic of 10 syllables with or without an additional short syllable, and in French the iambic of 12 syllables, called also an Alexandrine.

HEROLD, LOUIS JOSEPH FERDINAND, a French composer, born in Paris, Jan. 28, 1791, died at Termes, near Paris, Jan. 18, 1833. He studied successively with Mehul, Adam, and Cherubini, and, having by a successful competition for the prizes of the *conservatoire* procured the means for travel, passed 5 years in Italy. On his return to Paris in 1817 he wrote a number of works for the *opéra comique*, which were suc-

cessful in their day, but are now mostly forgotten. *Zampa*, produced in 1831, placed him in the first rank of French composers. His health, however, began to yield to the incessant demands upon his pen, and after the production of the *Pré aux clercs* and *La médecine sans médecine*, which were received with great favor, he died in the zenith of his fame. He is known altogether by his later works, which are frequently performed on the French and German stage, especially *Zampa*.

HERON, a wading bird of the family *ardeidæ*, and the old genus *ardea* (Linn.). The bill is much longer than the head, rather slender, sharp, and straight, with an emargination at the tip; the wings are long, the 1st quill nearly as long as the 2d and 3d, which are equal and longest; the tail short and even, of 12 stiffened feathers; tarsi long and slender, transversely scaled in front; tibiæ lengthened, bare for the lower third or half; outer toe longer than the inner, and united at the base to the middle one; hind toe long, on a level with the others; claws moderate, curved, and acute, the inner edge of the middle one pectinated. The body is rather compressed; the neck is very long, well feathered, and, by a beautiful arrangement in the cervical vertebræ, capable of being turned so that the head may be placed almost at a right angle with it; the bill is a formidable weapon, and used to inflict severe wounds on the incautious sportsman or its animal enemies. The herons are found in most parts of the world, migrating to the warmer regions as winter comes on; they are generally seen alone, standing solemnly in swamps, pools, and shallow rivers, waiting for their prey to come within reach, with the long neck drawn down between the shoulders; but no sooner does a reptile or a fish appear than the bill is darted forth and the animal immediately swallowed. They do not seize fish with their feet, as was formerly believed from the serrated middle claw; this comb-like structure is for the purpose of removing from the bill the sticky down which adheres to it after cleansing the plumage; the claw is passed from the tip to the base of the bill, on each side, and any feathers, slime of fish, or other adhering dirt, removed.—The bitterns and the egrets have been noticed under their titles, and the night herons will be described in their order. The common heron of Europe (*A. cinerea*, Linn.), celebrated in old times as the bird which afforded the principal sport in falconry, is of a bluish ash color, with a black crest on the hind head, and the fore part of the neck white with black dots; the shoulder of the wings and the primaries black; a naked space around the eyes. Its food consists of fish, frogs, aquatic insects and mollusks, mice, moles, and similar small animals. The nest is generally made on high trees in the vicinity of rivers. The flight is at times very high, and is performed with the legs hanging behind, and the head and neck resting on the back. It makes at times a harsh and loud scream; when taken young, it be-

comes so far domesticated as to associate with domestic fowl; though a royal bird in respect to game, its flesh is unfit for food. Heron hawking, once a favorite pastime of kings and nobles, and a fit emblem of the old-world relations between ruler and people, has never been introduced into America. It is distributed not only over Europe, but over most parts of the old world; among some eastern nations the crests of the males are highly esteemed as ornaments. The purple heron of Europe (*A. purpurea*, Linn.) is a very handsome bird, with the elegant shape of a heron and the rufous and purplish tints of the bitterns. The Louisiana heron (*A. ludoviciana*, Wils.) is about 27 inches long, with an extent of wings of 3 feet; the bill is very slender; the head with a long crest, the feathers, with those of the neck and upper back, lanceolate: like the egrets it has the feathers of the lower back plumose and lengthened; the color above is slaty blue on the head, neck, and exposed upper parts; lower back, rump, under parts, and middle line of throat, white; occiput and back of neck purplish; bill brownish black above and at tip; the female is like the male. From its beauty of form and plumage and grace of motion, Audubon calls this heron the "lady of the waters;" it is found on the coast of the southern Atlantic and gulf states, never far inland; it is a social bird, keeping in company and sometimes breeding in the same places with egrets and other herons; it is not very shy, and its flight is irregular and swifter than that of any other species. The nests are generally within a few feet of the ground, on low bushes, and very close to each other, made of small dried sticks crossed in various ways, flat, and each containing 3 eggs; these are about $1\frac{1}{2}$ by $1\frac{1}{4}$ inches, nearly elliptical, of a pale greenish blue color, thin, and smooth; the period of incubation is 21 days; as of most herons, the flesh of the young, before they leave the nest, is considered good eating. The snowy heron (*A. candidissima*, Gmel.; genus *garzetta*, Bonap.) is about 23 inches long, with an extent of wings of 38 inches; the head is ornamented with a full occipital crest of feathers with hair-like webs, and similar plumes on the lower part of the throat; dorsal plumes reaching to the end of the tail. The color is pure white; the bill black, yellow at base; legs black. It is found on the coast of the middle and southern states, and across the continent to California; it is a constant resident in Florida and Louisiana, and is occasionally seen as far north as Massachusetts. They breed in large communities, with other herons and with grakles, in a similar manner to the preceding species; the mangroves of Florida are favorite places for their nests; the eggs are 3 in number, about $1\frac{1}{8}$ by $1\frac{1}{4}$ inches, broadly elliptical, and pale bluish green; both sexes incubate, and the young in Florida leave their nest about the middle of May, and a month or two later further north; both eggs and young are destroyed by crows and turkey buzzards. They resort to the borders of salt marshes, and

feed on shrimps, small fish, crustaceans, snails, lizards, frogs, and aquatic insects; in the pursuit of their prey they run quickly through the shallows, throwing up their wings in a rapid and graceful manner; when wounded they defend themselves with the bill with great courage. The great blue heron (*A. herodias*, Linn.), generally called blue crane, is 4 feet long to end of tail, with an extent of wings of 6 feet, and the bill $5\frac{1}{2}$ inches with a gape of $7\frac{1}{4}$. The color above is bluish ash, with the edges of wings and tibiae rufous; neck cinnamon brown, head black, frontal patch white; below black, with broad white streaks on the belly; lower tail coverts white, middle line of throat the same with black and rufous streaks; bill greenish above, dusky yellow at the base; the quills black, and the tail bluish slate. There is considerable variation in size and plumage, according to age and habitat. It is found throughout the United States and the West Indies, but most abundantly in the low lands bordering on the Atlantic coast. It is one of the hardest of the family, bearing the cold of a New England winter; it is exceedingly difficult to approach, from the acuteness of its hearing and vision, except in close woods; it feeds at all hours of the day, and even in clear nights. It begins to breed from the beginning of March to the middle of June, according to latitude; during the love season they associate in pairs, being rather solitary at all other times; several pairs sometimes form a community, in swamps, pine barrens, and localities several miles from water, but especially in the vicinity of rice fields, and in the tops of cypress trees. The eggs, 3 in number, are $2\frac{1}{2}$ by $1\frac{1}{2}$ inches, of a dull bluish white color; the male and female sit alternately, feeding each other, and are remarkably affectionate to the young; the flesh of the young is tolerably good. Its food consists of fish, reptiles, birds, small quadrupeds, and large insects; it strikes its prey through the body, as near the head as possible, killing often by beating it against the ground; it is exceedingly voracious. This bird is capable of inflicting severe wounds with its bill, the more dangerous that it generally aims at the eyes; it has been seen to chase the fish hawk, and force it to yield up its prey. The flight is high, majestic, and long sustained. The weight of a full grown bird is from 6 to 8 lbs.; the intestine is about 9 feet long, not thicker than a swan's quill. The great white heron (*A. occidentalis*, Aud.) is more than 4 feet long, with an extent of wings of nearly 7; the bill 6 inches; the weight about 7 lbs. The color is pure white; the lengthened occipital feathers do not form a crest. It is found in southern Florida and in Cuba. This is the largest of the herons, and has the purest white plumage. It is very shy, breeding among the keys on the Florida coast, to which it resorts year after year; two nests are rarely seen near each other, though nests of other species are often on the same bush; it begins to lay about the 1st of February. It lays 3 eggs, $2\frac{1}{2}$ by $1\frac{1}{8}$ inches,

thick-shelled, of a plain light bluish green color; both sexes incubate, for about 30 days. It is more solitary than the preceding species, except on the feeding grounds; the walk is majestic, and the flight firm and regular; the sand bars and flats on which they feed are often far from their roosting places, and are rarely left until the water reaches as high as their body; the position, when roosting, is generally on one foot. There is a great enmity between this and the preceding species, and the former will always pursue, kill, and swallow the young of the latter whenever an opportunity offers, even though other favorite food be in abundance. The blue heron (*A. carulea*, Linn.; genus *florida*, Baird) is 22 inches long, with an extent of wings of 33; the bill is about 3 inches, and the weight 9 oz. The bill is slender and very sharp, and of a blue color; the prevailing tint of the bird is slate blue, with the head and neck bluish purple; legs black; the young are white, sometimes spotted with blue. The top of the head is moderately crested, and the scapulars greatly elongated. It is found in the southern Atlantic states and about the gulf of Mexico, and has been seen in New York; it associates with the white and Louisiana herons, roosting in the evergreens of the keys; it is very shy, and its flight is swifter than that of any except the *A. ludoviciana*. The eggs are $1\frac{1}{2}$ by $1\frac{1}{4}$ inches, of the same color as those of the snowy heron.—The green heron has been alluded to under BTERN. The sun herons of the warmer parts of South America belong to the genus *eurypyga* (Illiger), characterized by a long, slender, straight bill, bent and emarginated at the tip; long and ample wings; long, broad, and slightly rounded tail. The best known species (*E. helias*, Pall.) is about as large as a small grouse, with a long, thin neck, spreading tail, and comparatively short legs; the plumage is varied with bands and lines of brown, fulvous red, gray, and black, resembling the distribution of colors on some of the larger moths; it feeds on small fry and aquatic insects. It is called "little peacock" in Cayenne; its habits resemble those of the snipes more than of the herons.

HERON, or HERO, a philosopher and mathematician of Alexandria, who lived in the 3d century B.C. He was the inventor of several ingenious machines, among which are the fountain called by his name, in which a jet of water is kept playing by means of condensed air; a steam engine, on the principle of what is called Barker's mill, in which the boiler is caused to revolve round a vertical axis by jets of steam issuing from lateral holes in the arms with which it is provided; and a double forcing pump used for a fire engine. Heron wrote several works on mechanical and scientific subjects, of which only fragments remain; the most valuable is his *Πνευματικά*, or treatise on pneumatics, the best edition of which is that published at Paris in 1693, in the *Veterum Mathematicorum Opera*.

HERPETOLOGY (Gr. *ἑρπετον*, reptile or creeping thing, and *λογος*, discourse), the branch

of zoology which treats of the structure and classification of reptiles. The present article will be confined to the last division, the first being more properly noticed under REPTILES. The Egyptian and other ancient authors knew well the distinctions between the 4 reptilian orders, generally called tortoises, lizards, serpents, and frogs; Aristotle described them as terrestrial, red-blooded animals, laying eggs, and with 4 or no feet, mentioning tortoises, frogs, crocodiles, lizards, and serpents, and indicating the first 3 as amphibians. Pliny, 4 centuries later, divided reptiles into terrestrial, aquatic, and aerial, but he has mostly copied Aristotle, adding a great variety of fabulous stories whose influence has extended in the popular mind even to the present time. Gesner, in the 16th century, devoted a considerable part of his writings to the natural history of this class, illustrated with wood engravings, and conveniently arranged in alphabetical order. Aldrovandus, toward the end of the same century, wrote 2 books on serpents and lizards, compiling chiefly from the Greek and Arabian authors, and collected much information on the synonymy of reptiles, their symbolic history, and their uses in medicine. Ray published in London, in 1693, a synopsis of serpents, in which the manner of respiration, the size and color of the eggs, and similar characters, are made the basis of an unnatural classification.—Linnaeus divided the class of reptiles into orders, genera, and species, in his *Systema Naturæ*; calling them, however, *amphibia*, and characterizing them by the 3 principal marks of naked or scaly body, teeth sharp and without molars, and no fins with rays; he made 2 orders, serpents (without limbs) and reptiles (with limbs). With all his errors in regard to the orders, to him zoology owes the methodical nomenclature of genera and species, the former founded on positive characters, and the latter derived from some real or fancied peculiarity. In his 3d class, as given in Gmelin's edition of 1788, the order reptiles are those breathing by lungs, with 4 limbs, and a simple male sexual organ; serpents, on the other hand, have a rounded body without distinct neck, moving by its undulations, with dilatable and non-consolidated jaws, and without limbs, fins, or external ears. In the 1st order were 4 genera, the tortoise, dragon, lizard, and frog; and in the 2d, *crotalus*, *boa*, *coluber*, *anguis*, *amphisbæna*, and *cæcilia*, most of these genera being subdivided into numerous species.—Laurenti, in 1768, published a synopsis of reptiles, very remarkable for the time. Leaving tortoises out of the class, he gives their characters as follows: cold-blooded animals, without hair or mammae, with lungs acting without diaphragm and almost without the aid of the ribs (swallowing air into them), torpid in winter, devouring their prey without chewing and digesting it very slowly, able to exist for months without food, and renewing their youth by changing their skins. He makes 3 orders: *salientia*, or leapers, of which the principal genera are the pipa, the

toad, the frog, and the tree frog; *gradientia*, or walkers, including the other batrachians and the 4-footed saurians; and the *serpentia*, or creepers, comprising the ophisaurians and ordinary serpents. Many of his orders are natural, and to this day adopted; and his descriptions of the essential characters and habits of species are frequently excellent.—Lacépède, in 1788 and 1790, in a work continuing that of Buffon, entitled *Histoire naturelle des quadrupèdes ovipares et des serpents*, divided reptiles into 4 classes—tailed and tailless oviparous quadrupeds, biped reptiles, and serpents; the 1st containing the tortoises and saurians, the 2d the frogs and toads, the 3d and 4th being sufficiently characterized by the names; he made only 292 species.—Alexandre Brongniart, in 1799, taking into consideration not only the external characters but those presented by the mode of generation and development, divided reptiles into the 4 orders of chelonians, saurians, ophidians, and batrachians; the chelonians he separates into turtles and tortoises, giving the name of *emys* to the fluviatile species; the saurians include the crocodile and lizard families, his principal characters being derived from the form and attachments of the tongue, the shape of the body, the disposition of the tegumentary covering, and the number and arrangement of the toes; in the ophidians he makes the 6 genera of orvets, amphibiaena, crotalus, vipers, coluber, and boas; in the batrachians he places the frogs, toads, and salamanders.—Daudin, in 1802 and 1803, published a general treatise on reptiles, at the end of the 8th and last volume of which is a *résumé* in which he divides the class into 4 orders, like Brongniart; he describes about 550 species, but in a very hurried and incomplete manner, illustrated by drawings most of which are poorly executed; he made the batrachians a special study, and published a quarto monograph on them, which contains much valuable information.—Oppel, a Bavarian naturalist, published at Munich in 1811 a small quarto volume on the orders, families, and genera of reptiles, in which he adopts a mode of arrangement borrowed principally from Duméril; he makes 3 orders, *testudinata*, *squamata*, and *nuda*; the *testudinata* include the families *chelonii* and *amyde*; the saurian *squamata* the *crocodilini*, *geckoides*, *iguanoïdes*, *lacertini*, *scincoides*, and *chalcidici*; the ophidian *squamata* the *anguiformes*, *hydri*, *crotalini*, *viperini*, *constrictores*, *pseudoviperæ*, and *colubriini*; the *nuda* comprise the *apoda*, *caudata*, and *ecaudata*.—Merrem, in the 2d edition of his work *Tentamen Systematis Amphibiorum* (1820), gives the following system: reptiles are divided into 2 classes: 1, *pholidota*, a name borrowed from Aristotle, comprising those with a corneous or coriaceous skin; and 2, *batrachia*, of Brongniart, with a smooth and soft skin. The 1st class he divided into the orders *testudinata* (turtles and tortoises), *loricata* (crocodiles), *squamata* (other saurians and snakes); the 2d class includes the orders *apoda* (*cæcilia*), *salientia* (frogs and toads), and *gra-*

dientia (salamanders, tritons, proteus, and siren). It will be seen that much of this classification is borrowed from Oppel; at that time (1820) about 580 species of reptiles were described.—Latreille, in his *Histoire naturelle des reptiles* (1801), followed the classification of Lacépède with some slight modifications; in 1825, in his *Familles du règne animal*, adopting most of the divisions and some of the names of contemporary herpetologists, he makes 2 classes, reptiles and amphibians; the 1st includes, in the cuirassé section, the orders chelonians and emydosaurians or crocodilians; in the scaly section, the lacertiform and anguiform saurians, and the idiophid and batrachopod serpents; the amphibians are divided into caducibranchiates, which lose their gills, and perennibranchiates, which retain them through life, like the proteus and siren.—Cuvier, in his *Tableau élémentaire de l'histoire naturelle des animaux*, in 1798, divided reptiles, with Lacépède, into oviparous quadrupeds, serpents, and bipeds, giving, however, some new views on their division into orders, correcting errors in generic characters, and advocating a classification founded on organization. In 1800, Duméril introduced into the 1st volume of his *Leçons d'anatomie comparée* a classification adopting the names of Brongniart, and separating the batrachians as a distinct order. In 1817, in his *Règne animal*, and in the 2d edition in 1829, Cuvier published a new arrangement, based on internal as well as external structure, and following chiefly the method of Duméril, for many years professor of this branch in the museum of natural history at Paris. He makes 4 orders, of which the chelonians, saurians, and ophidians have a heart with 2 auricles, and the batrachians with a single auricle; the 1st two with limbs, the 3d without them; in the chelonians the jaws are toothless and corneous; in the saurians the jaws are furnished with teeth, and the limbs with 5 or 4 toes to each, including the crocodilians, lacertians, iguanians, gekkotians, chameleoniens, and scincoids; in the ophidians the skin is either scaly as in *anguis* and the true serpents, or naked as in *cæcilia*; in the batrachians the tail may be absent or long, the feet 4 or 2, and the lungs with or without coexistent branchia.—De Blainville, in 1822, established 2 classes for reptiles (*ostéozoaires*), reptiles proper (*squamifères ornithoïdes*), and ichthyoid amphibians; in the 1st class he made the 3 orders chelonians, emydo-saurians or crocodiles, and saurophians (saurians and ophidians); the 2d class included the 4 orders batrachians (frogs and toads), pseudo-saurians or salamanders, sub-ichthyians or amphibians proper (proteus and siren), and the pseudophidians or *cæcilia*.—Dr. J. E. Gray in 1825 published a synopsis of the reptiles and amphibians of North America; in the 1st class he makes 5 orders: 1, emydo-saurians or *loricata*, including the 3 families of crocodilians, ichthyosaurs, and plesiosaurs; 2, saurians, with 2 groups of families, one, like the agamas and geckos, with non-extensible tongue, the other

(saurians proper) with this organ capable of extension; 3, saurophidians, such as the scincks, *anguis*, *typhlops*, *amphisbæna*, and chalcidians; 4, ophidians or serpents, divided into the venomous and non-venomous groups; and 5, chelonians, with 5 families. The amphibians he makes a class by themselves, placing among them all batrachians, in the 4 orders of *anourea*, *urodeles*, sirens, and *apoda* or pseudophidians (*cæcilia*). This very natural system is founded largely on those of Merrem and Oppel. In 1831 the same author published, in vol. ix. of Griffith's edition of the *Règne animal* of Cuvier, a second synopsis with short descriptions; he divides reptiles, exclusive of amphibians, into 2 sections: *cataphracta*, or shielded reptiles, and *squamata*, or scaly reptiles; in the 1st he places the tortoises at the head, then the emydo-saurians (including the crocodiles and fossil emydo-saurians); in the 2d he arranges the saurians (lizards), ophisaurians, and ophidians. In this, and in subsequent modifications of it in the "Catalogues" of the British museum, he borrows largely from Wagler (noticed below) and contemporary writers; in the "Catalogues" of 1844 and 1849, he places in his 1st section of *squamata* the *sauria* (lizards) and *ophidia* (serpents), and in the 2d, or *cataphracta*, tortoises, emydo-saurians, and amphisbæniens; the saurians, or climbers, corresponding among mammals and birds to the *quadrumana* and *passeres* respectively; the ophidians (carnivorous) to the *feræ* and *accipitres*; the emydo-saurians (aquatic) to *cete* and *anseris*; the chelonians (large-hoofed) to *ungulata* and *gallinae*; and the amphisbæniens to *glires* and *gralla*. The amphibians he forms into a class, dividing it, with Fitzinger, into the sections *mutabilia*, which undergo metamorphosis, and with falling branchiæ, and *amphipneusta*, which undergo no metamorphosis, including the proteus, siren, *amphiuma*, *cæcilia*, &c.—Oken, in his "Physiophilosophy" (Ray society, 1847), gives a classification, elaborated between the years 1802 and 1826, in which he places reptiles in his 2d province of *sarcozoa*, 4th circle of fleshy animals, and 11th class of *myozoa* or *rhinozoa*; the first of the above class terms relating to the fact that typical or true muscles, of a red color, and provided with tendons, are first found in reptiles, and the last to the equally important fact that, in the genetic development of the organs of sense, the nose in reptiles, first in the animal series, opens into the mouth, permitting the passage of air to the respiratory organs. He makes 2 groups: A. Dermal reptiles, small-eyed, comprising 3 orders: I. Protozoid reptilia, containing families: 1, infusorial, petromyzoid reptiles (tailed batrachians, salamanders, &c.); 2, polypary reptiles (frogs); 3, acalephan reptiles (chelonians). II. Conchozoid or ophidian reptilia, with families: 4, muscel or eel-like reptiles (pythons, boas, &c.); 5, snail, or haddock-like reptiles (colubers and venomous adders); 6, kracken reptiles, with entire plates on belly and tail (rattlesnakes, &c.). III. Ancylozoid reptilia, or lizards, with fam-

ilies: 7, worm, tunny-like reptiles (*cæcilia*, blind-worm, and scincks); 8, crustacean or bream-like reptiles (dragons, basilisks, and iguanas); 9, ptilotoid or perch-like reptiles, like common lizards and monitors. B. Sarcose reptiles, large-eyed, with 2 orders: IV. Sarcose reptilia, containing families: 10, ichthyoid, herring-like reptiles (ichthyosaurus and plesiosaurus); 11, typical reptiles, salmon-like (geckos and chameleons); 12, ornithoid, pike-like reptiles (pterodactyle). V. Sensorial reptilia, with family 13, thricozoid, shark-like reptiles (crocodilians). This classification proceeds from the lowest reptiles (tailed batrachians) to the highest (crocodiles).—Carus, in his "Comparative Anatomy," French translation (1818 and 1834), places reptiles in his 3d circle, *céphalozoaires*, and 5th class, *céphalo-gastrozoaires*; with orders: I. *branchiata* (siren and proteus), having relations to fishes; II. *pulmonata*, the true representatives of the class, with the sub-orders batrachians, ophidians, saurians, and chelonians—some (ichthyosaurus and triton) approaching fishes, others (dragons) the birds, others (amphisbæna) even the worms, and others still (the tortoises) the mammalia; III. *alata*, related to birds, including the fossil pterodactyle. Much of this and subsequent classifications is borrowed from Oken.—Mr. Haworth, an English naturalist, presents an arrangement of reptiles, in the "Philosophical Magazine" for 1825, in which he applies his binary method to the class, which he calls *amphibia*; he divides it into *pholidota* and *batrachia*; the former may be covered with a carapace (*jornicata*), as turtles and tortoises, or not so covered (*ejornicata*), like the *loricata* (ichthyosaurians and crocodilians) and *squamata* (lizards and snakes); the *batrachia* may be without feet (like *cæcilia*), or with feet (frogs, salamanders, and sirens); it is taken principally from Merrem.—Fitzinger, in 1826, published at Vienna his *Neue Classification der Reptilien*, rich in anatomical and physiological research; he adopts the classification of Brongniart modified by Oppel, with much of the nomenclature of Merrem. The class is divided into 2 orders, *monopnoa* and *dipnoa*, according as the respiration is pulmonary only or pulmonary and branchial, the first corresponding to reptiles proper, and the last to batrachians. The *monopnoa* he separates into the tribes *testudinata*, with 5 families (turtles and tortoises); *loricata*, with 2 families (ichthyosaurians and crocodilians); *squamata*, with 22 families, including the saurians and serpents; and *nuda*, with naked skin (cæcilians). The *dipnoa* contain the tribes *mutabilia*, with 5 families (frogs, toads, and salamanders), and *immutabilia*, with 2 families, not undergoing metamorphosis (*siren*, *proteus*, *menobranhus*, &c.). In a table he gives some interesting affinities between reptiles and the higher and lower vertebrates; the pterodactyles, through the dragons and anolis, have some analogies with the mammal bats; the gavials and large fossil saurians connect the lizards with the cetacean

dolphins; some chelonians seem to connect reptiles with the mammal monotremata, and others (like the imbricated tortoise) with birds of the penguin family; in the same way the descent to fishes is made by the caecilians and the sirens. —The method of Ritgen, published in the volume for 1828 of the *Nov. Act. Acad. Naturæ Curiosorum*, is based upon correct principles, but the author has attempted to unite too many distinctive characters under one head, and has in this way originated a most sesquipedalian and ill-sounding nomenclature. He establishes 3 orders, *strepsichrota*, or reptiles with twisted body (ophidians, *sterriochrota*, or those with solid body (chelonians), and *campsiachrota*, with folded body (saurians and batrachians). —Wagler, in 1830, published at Munich his "Natural System of Amphibia," based essentially on their organization. He established 8 orders in the class, as follows: 1, the *testudines*; 2, the crocodilians; 3, the lizards; 4, the serpents; 5, the *angues* (blindworm, &c.); 6, *cæciliæ*; 7, *ranæ* (frogs and salamanders); and 8, *ichthyodes* (sirens, menobranchs, &c.), from their fish-like forms. He includes 248 genera. —J. Müller in 1832, in his work on the "Anatomy and Natural History of Amphibia," treats only of batrachians and serpents, dividing the former into the scaly and the naked, contrasting the peculiarities of their bony, respiratory, generative, and tegumentary systems, and their metamorphoses; serpents he divides, according to anatomical structure, into *microstomata*, with nondilatable mouth (4 families), and *macrostomata*, with dilatable mouth (7 families, whose characters are taken principally from the form and disposition of the teeth). It is full of valuable anatomical details, and is illustrated by excellent figures, especially of the osteology of the head of the smaller serpents of the order *microstomata*. —In chronological order would come here the classification of Duméril and Bibron, whose work, *Erpétologie générale, ou histoire naturelle complète des reptiles* (10 vols. 8vo., 1834-'54), is the most extensive ever published on this subject; though more recent observers have introduced some changes, their classification may be considered as representing, on the whole, the actual state of herpetology. When their work was commenced, in 1834, the materials at their command numbered about 850 species, which number they largely increased. They divide reptiles into the 4 orders of chelonians or tortoises, saurians or lizards, ophidians or serpents, and batrachians or frogs and salamanders. The order of chelonians (characterized by a short, oval, convex body, covered with carapace and plastron, 4 limbs, and absence of teeth) they divide into 4 families: 1. *Chersites*, or terrestrial tortoises, having the feet with immovable fingers, united into rounded stumps, provided with hoof-like ends; the carapace much arched, generally united into a single piece, but in the genus *cinixis* movable posteriorly, and the plastron generally immovable, but movable anteriorly in the genus *pyxis*.

It comprises the genera *testudo* (Brongn.), with 22 species, including the best known tortoises of America, Europe, Asia, and Africa; *homopus* (Dum.), with 2 south African species; *pyxis* (Bell), a single Asiatic species; and *cinixis* (Bell), with 3 American species. 2. *Elodites*, or marsh tortoises, with movable, distinct toes, naked jaws, and retractile head and neck. In the sub-family *cryptodères* the head and neck may be retracted completely under the middle of the carapace, the head is conical and the eyes lateral, and the plastron either immovable, movable anteriorly, or both anteriorly and posteriorly; in the sub-family *pleurodères* the head and neck are retractile only on one side of the opening of the carapace, the head is depressed, the eyes on the top, and the toes 5 or 4. The first sub-family contains the genera *cistudo* (Fleming), *emys* (Dum., very extensive), *tetronix* (Lesson), *platysternon* (Gray), *emysauris* (Dum.), *staurotypus* (Wagler), and *cinosternon* (Wagler); the second sub-family comprises the genera *peltocephalus* (Dum.), *podocnemis* (Wagler), *pentonyx* (Dum.), *sternotherus* (Bell), *platemys* (Dum.), *chelodina* (Fitz.), and *chelys* (Dum.). 3. *Potamites*, or fluviatile tortoises, with distinct toes, fleshy lips, 3 nails, flat carapace covered with a soft skin, and plastron prolonged behind and before to conceal the limbs, or narrow and without appendages. It contains the genera *gymnopus* (Dum.; *trionyx*, Geoffr.) and *cryptopus* (Dum.). 4. *Thalassites*, or marine turtles, with toes motionless and united into flattened swimming appendages, with the carapace corneous and scaly or covered with a leathery skin, containing the genera *chelonina* (Brongn.) and *sphargis* (Merrem). The order of saurians they divide into 8 families, whose characters had been previously given by other authors, especially Oppel, Fitzinger, Cuvier, Wagler, and Wiegmann, based upon the form and organization of the tongue, the nature of the integuments, and the disposition of the toes; the crocodilians form a natural transition from the chelonians, and the order gradually descends through the iguanas and lizards, the chalcidians, and scincks to the serpents. The order is characterized by an elongated body, scaly or shagreened, without carapace, feet generally with unguiculated fingers; tail lengthened, with a transverse cloaca toward the base; usually lids and a tympanum apparent; ribs, sternum, jaws with teeth and the halves united, no metamorphosis, and hard-shelled eggs. 1. The *aspidiotes*, or crocodilians, have the head without plates, the skin provided with corneous laminae or scales, the hind feet semi-palmated, shields on the back, crested tail, with the tongue not sheathed and attached all around to the lower jaw. There are 3 sub-genera: *alligator* (Cuv.), with 5 species; *crocodilus* (Cuv.), with 8 species; and *gavialis* (Geoffr.), with one species. 2. The *chelopodes*, or chameleons, with a single genus, *chameleo* (Brongn.) and 14 species. (See CHAMELEON.) 3. The *ascalabotes*, or geckos, which, with their 7 genera, have been

described under *GECKO*. 4. The *platynotes* (with wide, flat back), *varanians*, or *monitors*, have the head without plates, the skin scaly and tuberculated; the hind toes free at the base, and a long, flattened, bifurcated tongue; the 2 genera are *varanus* (Merrem), with 12 species, and *heloderma* (Wiegmann), with a single species. 5. The *eunotes*, or *ignarians*, have a scaly body, generally a crest on the back and tail, the tongue free at the end, well developed lids, and free unguiculated toes. This family contains many more genera than any other, and has been divided into 2 sub-families, *pleurodotes* and *acrodotes*, the former having the teeth simply applied to the internal edge of the maxillary groove, very near together, and not conical and pointed, the latter having them implanted in the very substance of the jaws, looking like molars posteriorly and like canines in front, and none on the palate. The *pleurodotes*, nearly all American, number 31 genera, among which are *anolis*, *basiliscus*, and *iguana*, with 95 species; the *acrodotes*, mostly Asiatic and African, and none American, have 15 genera and 53 species, among which are the dragons and agamas. 6. The *autosaures*, or *lacertians*, have the head covered with corneous plates, and the body with imbricated scales largest on the abdomen; body and tail much elongated; tongue free, fleshy, and bifurcated at the point. They have been divided into 2 sub-families, *pléodotes*, with solid teeth, and *célodotes*, with teeth hollow at the base. The *pléodotes*, separated into 2 groups according as the tail is compressed laterally or simply conical, include 10 genera, among which are the safeguards and *ameiva*, with 21 species, all American, and mostly tropical. The *célodotes*, also divided into 2 groups according as the toes are fringed or ridged or not, include 9 genera, among which are *lacerta* and *eremias*, with 43 species, all belonging to the old world. 7. The *cyclosaures*, or *chalcidians*, have the head covered with polygonal scales; rounded body, naked or covered with annular scales, and generally with a lateral fold or groove; tongue short, flat, free, divided at the point. They are divided into 2 sub-families, *ptychopleures*, with true imbricated scales, and *glyptodermes*, in which the skin, apparently naked, is arranged in rings of quadrangular tuberculated integument. The *ptychopleures*, or *chalcidians* proper, comprise 12 genera, among which are *zonurus*, *gerrhonotus*, *ophisaurus*, and *chalcides*, with 30 species, principally African and American. The *glyptodermes*, or *amphisbæniens*, include 4 genera, with 15 species, of which *amphisbæna* numbers 10. (See *AMPISBÆNA*, and *GLASS SNAKE*.) 8. The *lépidosaures*, or *scincoids*, have the head covered with corneous plates and the body with imbricated scales, tongue free and slightly divided at the tip, and a distinct tympanum. They are divided into 3 sub-families according to the structure of the eyes: *saurophthalmes*, with 2 lids as in *saurians*, *ophiophthalmes*, with mere rudiments of lids as in *ophidians*, and *typhlophthalmes*, in which the eyes are covered with

skin. The *saurophthalmes* include 25 genera, among which are *scineus*, *gongylus*, *seps*, *anguis*, and *acontias*, with 84 species. (See *BLINDWORM*, and *SCINCK*.) The *ophiophthalmes* comprise 5 genera with 8 species, among them the 4-lined lizard of Brazil; the *typhlophthalmes*, with rudimentary eyes, contain only 2 genera, each with a single species, *dibamus* (Dum.) of New Guinea, and *typline* (Wieg.) of southern Africa. The last 2 families comprise the snake-like reptiles, without feet, true lizards, but erroneously classified by many authors with *ophidians*. The order *ophidians*, as described by them in 1844, included about 520 species, the general characters being: an elongated rounded body, without limbs; mouth with pointed teeth; bones of jaws movable on each other and dilatible; a single occipital condyle; no distinct neck, nor concha, nor external auditory foramen, nor movable lids; skin coriaceous, extensible, scaly, covered with an epidermis falling off in a single piece. They make 5 sections or sub-orders, as follows: I. *Opotérodotes* or *scolécophides*, vermiform non-venomous serpents, with families *epanodontiens* or *typhlopiens* (6 genera), and *catodontiens* (2 genera). II. *Aglyphodontes* or *azémiophides*, non-venomous serpents like the boas and pythons; with families: 1, *holodontiens* or *pythoniens* (6 genera); 2, *aprotérodontiens* or *tortricians*, *boas*, *anacondas*, &c. (12 genera); 3, *acrochordiens*, with 3 East Indian genera; 4, *calamariens*, with 9 genera (none in Europe); 5, *upérolissiens*, with 4 East Indian genera; 6, *plagiodontiens*, with one Asiatic genus; 7, *coryphodontiens*, with one genus (including our black snake); 8, *isodontiens*, with 9 genera (various colubers); 9, *lycodontiens*, with 15 sub-genera; 10, *leptognathiens*, with 13 genera; 11, *syncrantériens*, with 4 genera (*tropidonotus* and *coronella*); and 12, *diacrantériens*, with 10 genera (*heterodon*, &c.). III. *Opisthophiles* or *aphébérophides*, coluber-like, venomous to small animals, having posteriorly one or more long and grooved teeth; with families: 1, *oxycéphaliens*, with 4 genera; 2, *sténocéphaliens*, with 4 genera in Central and South America; 3, *anisodontiens*, with 8 genera, principally from the East Indies, Africa, and America; 4, *platyrhiniens*, with 8 genera in the warm regions of America and Asia, spending much of their time in water; 5, *scytaliens*, with 6 genera, chiefly South American, whose wide and frequently turned-up snouts indicate subterranean habits; 6, *dipsadiens*, with 8 genera, African, American, and Asiatic. IV. *Protéroglyphes* or *apistophides*, with grooves in the anterior fangs, more venomous than the last section, and including 2 families: 1, *conocerques*, with 9 genera, among them *claps*, *bungarus*, and *naja*; 2, *platycerques*, with 6 genera, living in water in the tropics, characterized by a flattened tail. V. *Solénoglyphes* or *thanatophides*, the most venomous of all serpents, containing the families: 1, *vipériens*, with 6 genera; and 2, *crotaliens* (rattlesnakes), with 7 genera. The last order of reptiles, the *batrachians*, they

characterize as follows; body naked; 2 occipital condyles; no distinct neck; limbs absent, 2, or 4, and of various proportions, and the toes generally without nails; sternum usually distinct, never united to the ribs, which are either absent or short; no prominent male sexual organ; eggs with soft non-calcareous envelope; the young generally undergoing metamorphosis; with or without a tail. Their 3 sub-orders are: I. *Péromèles* (without limbs), serpent-like, with a single family, *ophiosèmes* or *cécilioides*, including 4 genera, of which *cæcilia* is the best known. II. *Anoures* (tailless), with the groups *phanéroglosses*, having a distinct fleshy tongue, and *phrynoglosses*, in which this organ is not distinct. The 1st group contains the families: 1, *raniformes* (common frogs), with 16 genera and more than 50 species; 2, *hylæformes* (tree frogs), with 16 genera and more than 60 species; 3, *bufoniformes* (toads), with 12 genera and nearly 40 species. The 2d group contains the single family *pipaformes*, with the genera *daetylothra* (Cuv.) and *pipa* (Laurenti). III. *Urodèles* (tailed), with the groups *atrédères* (with neither branchial openings nor gills), with the family *salamandrides* (containing 16 genera), and the *trématodères*, with the families *protéides* (with 4 genera) and *amphiumides* (with 2 genera).—McLeay, in the *Horæ Entomologica* (1819-'21), divides the animal kingdom into 5 great circles, each containing 5 smaller ones; the 5 groups of the class reptiles he considers to stand in the following natural order: 1, the chelonians; 2, emydo-saurians, or crocodiles; 3, saurians; 4, dipod or 2-footed serpents; and 5, apod or true serpents—the extremities of the column seeming to meet in the *chelodina longicollis* (Gray), and the whole forming a group distinguished from birds by being cold-blooded, and from amphibia by having 2 auricles to the heart, by undergoing no metamorphosis, and by a different method of generation. One great defect of this classification is that it leaves entirely out of view the fossil enaliosaurian reptiles.—Swainson, in his "Natural History of the Monocardian Animals" (Lardner's "Cyclopædia," vol. ii., 1839), like McLeay, makes a distinct class of the amphibia, and divides reptiles into 5 orders: 1, emydo-saurians, or crocodiles; 2, chelonians, with families *testudinidæ*, *emydæ*, *triongyidæ*, *chelonidæ*, and *chelydridæ*; 3, enaliosaurians (*ichthyosaurus*, &c.); 4, ophidians, with families *hydrophidæ*, *crotalidæ*, *coluberidæ*, *anguidæ*, and *amphisbenidæ*; and 5, saurians, with families *chamæleonidæ*, *iguamidæ*, *laceridæ*, *agamidæ*, and *scincidæ*.—Straus-Durckheim, in his *Traité d'anatomie comparative* (1843), divides his 3d class, or reptiles, into the 3 orders of saurians, ophidians, and batrachians, making a separate and 4th class of the chelonians, with the single order of *testudinata*.—Stannius, in the 2d volume of the 2d edition of his "Manual of Comparative Anatomy" (Berlin, 1854-'6), in the class 17, *reptilia*, makes 2 sub-classes: 1, *dipnoa*, with orders *urodela*, *batrachia*, and *gymnophio-*

na; 2, *monopnoa*; a, *streptostylia*, with orders *ophidia* and *sauria*, and b, *monimostylia*, with orders *chelonina* and *crocodilia*. Milne-Edwards, in his *Cours élémentaire d'histoire naturelle* (1855), divides the vertebrata or *ostéozoaires* into 2 sub-branches; in 1, the *allantoidiens*, he places with mammals and birds the class of reptiles, with the orders *chelonina*, *sauria*, and *ophidia*; and in 2, *anallantoidiens*, with fishes, he places the batrachians, with the orders *anura*, *urodela*, *perennibranchia*, and *cæcilia*.—There are several German systems of classification, which deserve notice in regard to reptiles. Von Baer, in 1826-'8, in his vertebrate or doubly symmetrical type, rises from osseous fishes to amphibia in which lungs are formed, the branchial fringes remaining in the sirens and disappearing in the *urodela* and *anura*; thence to reptiles, which acquire an allantois, but have no umbilical cord, nor wings, nor air sacs, the last two being characteristic of birds. Van Beneden, in his *Anatomie comparée* (Brussels, about 1855), makes reptiles and batrachians the 3d and 4th classes in his *hypocotyledones* or hypovitellians (*vertebrata*), in which the vitellus enters the body from the ventral side; the reptiles he divides into *crocodili*, *chelonii*, *ophidii*, *saurii*, *pterodactyli*, *simosauri*, *plesiosauri*, and *ichthyosauri*; and the batrachians into *labyrinthodontes*, *peromelia*, *anura*, *urodela*, and *lepidosirenina*. Vogt, in his *Zoologische Briefe* (1851), bases his classification on the contrast between the embryo and the yolk, and makes the reptiles and amphibians the 3d and 4th classes in the vertebrata, or animals with the yolk ventral; in reptiles he includes the orders *ophidia*, *sauria*, *pterodactylia*, *hydrosauria*, and *chelonina*; and in amphibia the orders *lepidota*, *apoda*, *caudata*, and *anura*. These classifications are important, as showing the tendency of modern zoology to combine embryological with external and structural characters, in establishing the natural divisions among animals; for full details and interesting remarks on these and other systems, the reader is referred to the "Essay on Classification" in Prof. Agassiz's "Contributions to the Natural History of the United States," vol. i.—T. Rymer Jones, in the article "Reptilia," in the "Cyclopædia of Anatomy and Physiology," vol. iv., gives the following classification, considering the batrachians as a separate class: Order I. *chelonina*, with the single family *testudinidæ*; II. *sauria*, with families *crocodilidæ*, *lucertidæ*, *iguunidæ*, *geckotidæ*, *chamæleonidæ*, and *scincidæ*; and III. *ophidia*, with families *anguidæ*, *serpentidæ*, and *cæciliidæ*.—Van der Hoeven, in his "Handbook of Zoology" (English translation, 1858), thinks De Blainville went too far in elevating the batrachians into a class, and goes back toward the old fourfold division, adding however 2 orders. He divides reptiles into 2 sections: *diplopnoa* or *psiloderma*, breathing by lungs or gills and with smooth skin; and *haplopnoa*, breathing by lungs only, and with a scaly skin. The

diplopnoa comprise 3 orders: I. *Ophiomorpha*, with the family: 1, *cæciliæ*, and single genus *cæcilia*. II. *Sauvobatrachii*, with families: 2, *proteïdæ*, and 3, *salamandrina*. III. *Batrachii*, with family 4 of the same name. The *haplopnoa* continue the orders, as follows: IV. *Ophidia*, with families: 5, *viperina*; 6, *elapina*; 7, *hydrophes*; 8, *asineophes*; 9, *colubrina*; 10, *aerochordina*; 11, *pythonina*; 12, *cylindrophes*; 13, *rhinophes*; 14, *typhlina*; and 15, *amphisbæna*. V. *Saurii*, with families: 16, *scincoidei*; 17, *zonosauri*; 18, *lacertini*, with the tribes *lacerta*, *ameiva*, and *monitores*; 19, *iguanoidei*; 20, *chamaeleonidei*; 21, *ascalabotæ*; and 22, *crocodylini*. VI. *Cheloni*, with family 23 of the same name.—First in the order of American classifications of native reptiles is that of Harlan, given in the "Journal of the Philadelphia Academy of Natural Sciences" (vols. v. and vi., 1826). He adopts Brongniart's 4 orders, dividing them as follows: 1, *batrachia*, divided into 3 sections according to the mode of respiration; the 1st has the branchial openings persistent, as in *amphiuma* and *menopoma*, the 2d with persistent branchiæ, like *siren* and *menobranthus*, and the 3d with deciduous branchiæ, breathing by lungs in the adult state (salamanders, frogs, and toads); 2, *ophidia*, with 6 North American genera; 3, *sauria*, with 6 genera; and 4, *chelonina*, with 3 families of land, fresh water, and sea tortoises, with 2, 3, and 2 genera respectively. Dr. J. E. Holbrook, in his "North American Herpetology" (5 vols. 4to., 1842), adopts the 4 orders of *chelonina*, *sauria*, *ophidia*, and *batrachia*; in the *chelonina*, *sauria*, and tailless *batrachia*, he follows essentially the arrangement of Duméril and Bibron; in *ophidia* he prefers Cuvier's classification; and in the tailed *batrachia*, a system partly from Cuvier and partly from Fitzinger. It is very valuable to the American student, both for its lucid descriptions and excellent illustrations. Messrs. Baird and Girard have published in the "Reports of the Smithsonian Institution" (1853) a catalogue of North American serpents, of the families *crotalidæ*, *colubridæ*, *boidæ*, and *typhlopodæ*; of 35 genera they make 22 new, and of 119 species 54 new. Mr. Baird has published a revision of the North American tailed batrachia, with new genera and species, in the "Journal of the Academy of Natural Sciences" (vol. i., 2d series, 1850), adopting the 2 groups of Duméril and Bibron, *atreptodera* and *trematodera*. In the same journal, vol. iii., 1858, is a paper by Dr. E. Hallowell on the caducibranchiate batrachians, including the families *salamandridæ*, *seiranotidæ*, *pleurodelidæ*, *plethodontidæ*, *bolitoglossidæ*, *ambystomidæ*, *tritonidæ*, *ellipsoglossidæ*, and *hemidactylidæ*. Mr. J. Le Conte, in the "Proceedings of the Academy of Natural Sciences" (vol. vii., 1854), gives a catalogue of the American testudinata, which he divides into 3 families, corresponding to sea, fresh water, and land tortoises. Other catalogues of American reptiles, more or less extensive,

are scattered through the scientific journals. De Kay, in the "Natural History of New York" (1842), divides its reptiles into the orders: 1, *chelonina*, with family *chelonidæ*; 2, *sauria*, with families *scincidæ* and *agamidæ*; and 3, *ophidia*, with families *coluberidæ* and *crotalidæ*. The amphibia he divides into the families *ranidæ*, *salamandridæ*, *sirenidæ*, and *amphiumidæ*. Prof. Agassiz, in his "Essay on Classification" (1857), insists on the separation of the amphibians as a class from the reptiles, from the different manner in which their structural plan is carried out; the former breathe by lungs or gills, undergo metamorphosis, lay a large number of small eggs, and have a naked skin; the latter are covered with horny scales, lay few and comparatively large eggs, breathe by lungs, and undergo no marked transformation; these differences require special ways and means in framing their structure, which ought to rank them as distinct classes. Prof. Agassiz divides his 5th class, or amphibians, into 3 orders, *cæciliæ*, *ichthyodi*, and *anura*; and the 6th and higher class, reptiles, into 4 orders, *serpentes*, *saurii*, *rhizodontes*, and *testudinata*. In part ii. of his 1st volume, above referred to, he divides the order *testudinata* into the sub-orders: 1, *chelonii* (Opp.), with 2 families, *chelonioidæ* and *sphargidæ*; 2, *amydæ* (Opp.), with 7 families, *trionychidæ*, *chelyoidæ*, *hydraspidæ*, *chelydroidæ*, *cinosternoidæ*, *emydoidæ*, and *testudinina*. A large part of the 1st and all of the 2d volume is taken up in the consideration of the whole subject of North American testudinata, with numerous illustrations.—The above are the principal systems of herpetology, and are sufficient to show the progress of this branch of zoology, and its gradual approach toward a natural method of classification. Those who wish to pursue the subject into its details are referred to the list of authors in the work of Duméril and Bibron, and in the foot notes to the essay of Prof. Agassiz.

HERRERA, FERNANDO, a Spanish poet, surnamed "the Divine," born in Seville in 1534, died in 1597. Although an ecclesiastic, many of his verses are amatory effusions addressed to a lady, said to have been the countess of Gelves, whom he celebrates under the names of Estella, Eliodora, and Aglaë. His best poems are mostly sonnets, odes, and elegies. An edition of his works was published at Seville in 1582. His prose writings remaining are: *Relación de la guerra de Chipre y suceso de la batalla de Lepanto* (8vo., Seville, 1572), and a translation of Stapleton's life of Sir Thomas More. His contemporaries mention poems on the battle of the giants, the rape of Proserpine, and Amadis, and a Spanish history to the time of Charles V., which have not been preserved.

HERRERA, JOSÉ JOAQUÍN DE, a Mexican president, born in the latter part of the 18th century, died in the city of Mexico, May 15, 1851. He participated in many of the events that have occurred in Mexico since the days of Iturbide. He was elected provisional president,

Dec. 6, 1844, and soon afterward constitutional president. He was in favor of the recognition of Texan independence, and opposed to the war with the United States, and was charged by Paredes with seeking to dismember the Mexican union by negotiating with the latter. The whole army soon pronounced against him, and he was deposed, Dec. 30, 1845, and succeeded by Paredes. Herrera was excluded from military command until the battle of Cerro Gordo (April 18, 1847), in which he took part. After the establishment of peace with the United States he was again elected president (June 3, 1848). He endeavored to restore order in the finances, but his efforts were paralyzed by the disturbed condition of the country. He was succeeded by Arista, Jan. 15, 1851, and died soon afterward. He was much esteemed on account of his high personal character, and was very favorably disposed toward this country.

HERRERA Y TORDESILLAS, ANTONIO DE, a Spanish historian, born in Cuellar in 1549, died in Madrid, March 29, 1625. Vespasian de Gonzaga, Spanish viceroy of Naples, to whom he was secretary, recommended him to Philip II., who appointed him chief historiographer of the Indies and one of the historiographers of Castile. The most interesting of his works is his *Historia general de los hechos de los Castellanos, en las islas y tierra firme del mar oceano* (4 vols. fol., Madrid, 1601), containing the best account we have of the progress of events in America from 1492 to 1554. An enlarged edition of the original work was printed under the title of *Descripcion de las Indias occidentales* (4 vols. fol., Madrid, 1730). He wrote several other historical works, among them a general history of the world during the reign of Philip II.

HERRICK, ROBERT, an English poet, born in London, Aug. 20, 1591, died in Oct. 1674. By the liberality of a rich uncle, Sir William Herrick, he was enabled to finish his education at Trinity hall, Cambridge, where he took the degree of M.A. For many years after leaving the university he seems to have pursued a gay and dissipated career in London, in the companionship of Ben Jonson and other choice spirits, to whom he was probably known as a wit and a poet. Finding this mode of life less profitable than agreeable, he took orders, and in 1629 was presented by Charles I. to the vicarage of Dean Prior, near Totness, in Devonshire. To a man of his habits the change of scene must have seemed like a species of exile; but notwithstanding the disgust with which he was accustomed to speak of his new home and associates, his cheerful but rather free muse appears to have thriven in this rural solitude. His poems written at this time abound in lively descriptions of the charms of a country life, and his fancy revelled in amatory verses, after the fashion of the day, to beauties whom his imagination was forced to supply, for his small household comprised only himself and his old housemaid Prudence Baldwin. Some of these pieces also contain curious illustrations of

country customs, manners, and prejudices. From this humble retreat the long parliament ejected him in 1648, and he returned to London, where he gladly resumed the society of such of his old associates as were living, but led a somewhat precarious existence, depending upon the assistance of his friends and relatives. In 1647 and 1648 he published his "Noble Numbers" and "Hesperides, or Works Humane and Divine," which, like a staunch royalist, he dedicated to "the most illustrious and most hopeful Prince Charles." On this occasion he dispensed with the prefix of Reverend, and, in consideration of the class of readers who would peruse his works, announced himself as "Robert Herrick, Esquire." His patron, however, at the restoration, did nothing better for him than to reinstate him in his old living, where he passed the remainder of his days. Herrick was essentially a lyric poet, and the facility with which he wrote is recognized in the multitude of little pieces, amatory, Anacreontic, and pastoral, which his works contain. His frequent indelicacy is the gravest charge which has been brought against him. In that, however, he but followed the fashion of the cavalier poets, among whom, notwithstanding his profession, he is reckoned; and the hearty gaiety and natural tenderness which gleam through his lighter works show that he was less influenced by licentious feelings than by a gross taste. His serious pieces are unexceptionable in a moral point of view, but have generally less poetical merit. Inferior to several of his contemporaries in various qualities, indebted to them occasionally for choice thoughts, he will nevertheless live long in the language by many charming little poems, polished with all the refinement of art, and unsurpassed in melody of numbers. For nearly a century and a half after Herrick's death his works lay neglected. In 1810 a selection from the "Hesperides" was edited by Dr. Nott, and since then several excellent editions have been published in England and America, including one by Prof. Child (2 vols. 12mo., Boston, 1856). A new edition of his poetical works was published in London in 1859. Many of his shorter songs, such as "Cherry Ripe" and "Gather ye rose-buds while ye may," have been set to music.

HERRING, the general name of the family *clupeidae*, of the malacopterous or soft-rayed abdominal fishes. The family has been divided by Valenciennes, according to the position of the teeth, size of the ventrals, length of the anal, and projection of the lower jaw, into 16 genera, of which the best known and most important are *clupea* (the herring), *harengula* (the sprat), *rogenia* (the white bait), *alosa* (the shad and pilchard or sardine), and *engraulis* (the anchovy and red fish). The last has been described under *Anchoovy*, and, as the others will be noticed in their regular order, the herrings proper will alone be noticed here. The generic characters of *clupea* (Cuv.) are small pre-maxillary teeth, with very fine ones also on the maxillary and symphyseal portion of the lower jaw, larger teeth

in a longitudinal band on the vomer and centre of tongue, and a few deciduous ones on the palatine bones; body elongated and compressed, with rounded back, and sharp, keel-like abdominal edge; scales large, thin, and easily removed; a single dorsal fin, and 8 branchiostegous rays; mouth large, and lower jaw the longer; the air bladder is very large, and the number of long and slender bones among the muscular fibres very great; the branchial openings are wide, and the gills remarkable for the length of their fringes, in consequence of which they live but a short time out of water, indeed dying so soon that "dead as a herring" is a common English saying. The herrings do not ascend rivers like the alewife and shad.—The common American species, or blue-back, sometimes erroneously called "English herring," is the *C. elongata* (Lesueur); it varies in length from 12 to 15 inches; the color above is deep blue, tinged with yellow, with silvery sides and lower parts; opercles brassy, and, like the sides, with metallic reflections; irides silvery and pupils black. It is found on the coasts of New England, New Brunswick, and Nova Scotia; it is generally most abundant from March to May, but according to Mr. Perley is caught on the shores of New Brunswick during every month of the year, precluding the idea that it is a migratory fish. In the spring it is often caught in seines and sweep nets to the amount of 100 barrels or more in a single night; it is eaten fresh, salted, and smoked, when salted bringing \$3 a barrel; the young fish, called spirling, make excellent bait for cod, being caught in nets and sold for about \$1 50 a barrel. Until within the last 20 years this herring was very abundant on our coasts, frequenting the harbors of Cape Cod in myriads from March till June; since that time it has been comparatively rare; in Massachusetts by great quantities were formerly caught by nets when following the light of a large torch in a swiftly rowed boat. The herring fishery seems to have been prosecuted by the pilgrims, and we read of the herring "wear" at Plymouth having been rented to 3 men for a term of 3 years. Dr. Storer considers the brit, *C. minima* (Peck), the young of this species. When this herring first made its appearance in Long Island sound in 1817, it was mistaken for the English herring, and it was gravely stated that it followed the British squadron thither in the attack upon Stonington in 1814. Several other American species are described in Dr. Storer's "Synopsis of the Fishes of North America."—The common herring of Europe (*C. harengus*, Linn.) is from 10 to 13 inches long, having the back and the upper portion of the sides sky-blue with a tinge of sea-green; belly and sides bright silvery; cheeks, gill covers, and irides tinged with gold. The food of the herring appears to be chiefly minute crustaceans and worms, and sometimes its own fry and other small fish. It is the popular belief that the herrings retire in winter to the arctic regions, whence they mi-

grate in immense shoals in spring, summer, and autumn to the coasts of Europe, Asia, and America. Yarrell and other modern observers doubt this, and maintain that these fish merely come from deep water to the shores in their spawning season, making no very lengthened journeys, and by no means the migrations described by Pennant and the older naturalists; at any rate they are found on both the American and European coasts at all seasons, but sometimes disappear for years from certain localities, probably as their favorite food is abundant or scarce, and they have not been observed on their return northward. Wherever they come from, they appear in vast shoals, covering the surface of the sea for miles; they afford food for rapacious birds and aquatic animals, and supply material for one of the most important fisheries. They vary considerably in size in different latitudes and in limited localities, being generally largest and in best condition in the north; the time of spawning is various, as we have spring, summer, and autumn herrings. Notwithstanding the destruction of these fish by man and animals, their numbers do not diminish, a fact not astonishing when it is remembered that about 70,000 ova exist in each female, a large portion of which might be unfecundated or destroyed and yet enough remain to stock the ocean. The regularity of their appearance and their immense numbers have made them the pursuit of man from the earliest times; the herring fishery of France dates back to the beginning of the 11th century, and that of Great Britain 300 years earlier, and both have proved excellent schools for the hardy seamen for the mercantile and naval service of these countries. In the words of Lacépède, the herring is one of those natural productions whose use has decided the destiny of nations; caprice and luxury render valuable coffee, tea, spices, and silk, but necessity demands the herring of the northern ocean. Political economists in England, France, and Holland have always regarded this fishery as of the greatest national importance, in its influence on the marine service, as a source of profitable industry at home and of extensive commerce abroad. The produce of the herring fisheries of Great Britain in 1855 was 897,463 bbls., being an increase of 157,111 over the previous year. The total number of persons engaged in them was 94,155: 41,602 men and boys and 11,747 boats being employed in the shore curing department. In 1856, 609,983½ bbls. of herrings were cured, and 347,611½ bbls. exported. The whole quantity caught was 717,673½ bbls., of which 337,443 bbls. were taken on the coast between Northumberland and the Lewes. The yield from the same fishing grounds in 1858 amounted to 393,035 bbls. In France, 180 vessels of 8,000 tons burden are engaged in catching herrings for salting, and the annual yield is about 8,350 tons. About 100 of these vessels are owned at Boulogne, where the fishery is better organized than anywhere else in France. About 470 vessels with a burden of

10,000 tons are also engaged in taking herrings to be sold fresh; they capture annually about 14,770 tons. The Dutch fisheries, which were once very flourishing, have greatly declined. On the coasts of Norway and Sweden 700,000,000 have been taken in a year, and sometimes 20,000,000 in a single fishery. In most of the northern countries of Europe large quantities are annually captured. For a detailed account of the habits and fishery of the herring, the reader is referred to vol. xx. of the *Histoire naturelle des poissons*, by Cuvier and Valenciennes, by whom several other species are described.—The history of this fish is connected with many strange superstitions and beliefs; their sudden disappearance has in various places been attributed to fires on the shores, the discharge of cannon, and the action of steamboat wheels. De Kay alludes to a satire on such wild conjectures in a statement before the house of commons in England, as follows: "A clergyman on the coast of Ireland having signified his intention of taking the tithe of fish, it was considered to be so utterly repugnant to the privileges and feelings of the finny race, that not a single herring has ever since visited that part of the shore."

HERRING, JOHN FREDERIC, an English painter, born in Surrey in 1795. His father was a London tradesman, an American by birth, and his own taste for painting seems to have been incited by the sight of the St. Leger race at Doncaster, whither he had gone, when a boy of 18, in search of employment. His highest ambition thenceforth was to paint a race horse, and for 18 years, part of which time he was the driver of a stage coach, he persevered in his efforts until he achieved a reputation in this class of subjects second to that of no painter in England. For 33 years he took the portraits of the winners of the Doncaster St. Leger, and painted an immense number of racers and racing scenes for eminent patrons of the turf. Of late years he has enlarged the sphere of his subjects, and executed scenes from the farm yard, in which, although the horse is still the prominent object, many other animals and a variety of fowls and birds are introduced. Many of these are extensively known through engravings, which have considerable popularity in the United States, where some of his best pictures have also been exhibited.

HERRNHUT, a small Saxon town, in the circle of Bautzen, on the railway from Dresden to Zittau, distant from the former city 57 m.; pop. 1,000. It is the mother colony of the sect of Moravians, established in 1722 by descendants of the ancient Moravian and Bohemian brethren, who were driven from their own country by the persecution of the Jesuits. On their arrival in Saxony they enlisted the sympathy of the pious Count Zinzendorf, who granted them an asylum and land on his estate of Berthelsdorf, and who is regarded as the founder of the sect. A monument marks the place where he caused the first tree to be felled

to clear ground for the new settlement, to which the brethren gave in 1724, when the first meeting house was inaugurated, the name of Herrnhut (protection of the Lord), in token of their faith in Providence. Some derive the name Herrnhuter (the Lord's watch) from a passage in the 84th psalm: "To watch the door in the house of my God." Herrnhut is distinguished by the stillness, cleanliness, and order which prevail in it. It is the central point of the Moravians, who numbered in 1859 about 11,000 members in Europe. Generally, but especially in the plainness of their dress, they bear some resemblance to the members of the society of Friends. The young girls wear deep red ribbons; unmarried women, pink; married, blue; and widows, gray or white. A committee of elders at the neighboring village of Berthelsdorf has presided since 1789 over the affairs of the community, in place of Zinzendorf, who on his death in 1760 bequeathed to it his estate of that name. The cemetery of Herrnhut commands a lovely view, a sort of cliff or group of rocks (Hutberg) surmounted by a temple or look-out house rising above it. The sales rooms for the manufactures produced by the Herrnhuters are extensive. The principal of them are colored paper (*Herrnhuter Papier*), candles, and especially linen (*Herrnhuter Leinwand*), which branch of industry may be said to have been first naturalized in Saxony by the indefatigable exertions of the brethren. Herrnhut contains a museum of natural history collected by Moravian missionaries in different parts of the world. It is also the seat of a bishop, and from time to time general synods are held there, when all the bishops and elders of the Moravians are represented. The last synod, held June 8, 1857, was attended by 60 Moravian delegates from Germany, England, and the United States. (See MORAVIANS.)

HERSCHEL, CAROLINE LUORETIA, sister of Sir William Herschel, born in Hanover, March 16, 1750, died there, Jan. 9, 1848. She lived in Hanover till her 22d year, when she went to England to join her brother William at Bath. Here she turned her attention to astronomy, giving great assistance to her brother, not only taking the part of an amanuensis, but frequently performing alone the long and complicated calculations involved in the observations. For her valuable assistance to the great astronomer she received a pension from George III. Meanwhile she took her own separate observations of the heavens, with a small Newtonian telescope which her brother had made for her. With this she devoted herself particularly to a search after comets, and between 1786 and 1805 discovered alone 8 of these bodies, of 5 of which she was the first observer. Her contributions to science, most of them in her brother's works and under his name, are very valuable. She took the original observations of several remarkable nebulae in her brother's catalogue, and computed the places of his 2,500 nebulae. Humboldt speaks of a still unresolved nebula,

having nearly the same shape as and lying near the elliptical nebula of Andromeda, as discovered by his friend Miss Herschel. In 1798 she published her "Catalogue of Stars taken from Mr. Flamsteed's Observations, contained in the second volume of the *Historia Cælestis*, and not inserted in the British Catalogue, with an Index to point out every observation in that volume belonging to the stars of the British Catalogue; to which is added a collection of Errata that should be noticed in the same volume." This work was published at the expense of the royal society, and contained some 560 stars which had been omitted by the framers of the British catalogue. After her brother's death she returned to her native city, and there passed the rest of her days. In 1828 she completed a catalogue of the nebulae and stars observed by her brother, for which she received a gold medal from the astronomical society of London, and was elected an honorary member of it.

HERSCHEL, SIR JOHN FREDERIC WILLIAM, an English astronomer, born in Slough in 1790. The only son of the distinguished Sir William Herschel, he followed closely in his father's footsteps. He was graduated at St. John's college, Cambridge, in 1813. He now turned all his energies to the study of mathematics and astronomy, and in 1820 published his "Collection of Examples of the Application of the Calculus to Finite Differences." About 1825 he began his observations in sidereal astronomy, to which he chiefly devoted himself, partly in conjunction with Sir James South, and the results of his observations for 8 years were communicated to the royal astronomical society in a series of catalogues, the first appearing in 1825, for which he received from them their gold medal. In 1830 he published important measurements of 1,236 stars, which he found with his 20 feet reflector. In 1830 he wrote for the "Encyclopædia Metropolitana" a treatise on "Sound," and for the same work, in 1831, a treatise on the "Theory of Light." In Lardner's "Cyclopædia" he published a "Preliminary Discourse on the Study of Natural Philosophy," and a "Treatise on Astronomy." About the same time, too, he wrote several experimental essays on different branches of chemistry, magnetism, and optics. His great enterprise was his expedition to the Cape of Good Hope, to take observations of the whole firmament of the southern hemisphere. Taking with him the same instruments (a 20 feet reflector with an 18½ inch aperture, and a 7 feet achromatic with a 5 inch aperture) which he had used in the northern hemisphere, that his results might be compared with his former ones, he arrived at the Cape, Jan. 15, 1834, and settled at Feldhuysen, about 6 miles from Table bay. He examined carefully and measured the stars of the southern skies, and completed the wonderful "gauging of the heavens" which had been begun by his father. His observations lasted 4 years, the entire expense of which was defrayed by himself, though an ample indemnity was offered him by

government. During his absence, in 1836, the royal astronomical society again voted him their gold medal, and on his return honors were heaped upon him. The royal society proposed to make him their president, but he was unwilling to accept the office. In 1838, at the coronation of Queen Victoria, he was created a baronet. In 1839 he received the degree of D.C.L. from Oxford, and in 1842 he was elected lord rector of Marischal college, Aberdeen. It was not till 1847, 9 years after his return from the Cape, that the results of his observations there were published, when they appeared in a large 4to. volume entitled "Results of Astronomical Observations made during the Years 1834-'8 at the Cape of Good Hope, being the completion of a Telescopic Survey of the whole surface of the Visible Heavens, commenced in 1825." This work, one of the most considerable and valuable of our time, is divided into 7 portions: 1, "Nebulae of the Southern Hemisphere;" 2, "The Double Stars of the Southern Hemisphere;" 3, "Astronomy, or the Numerical Expression of the Apparent Magnitudes of Stars;" 4, "The Distribution of Stars, and the Constitution of the Galaxy in the Southern Hemisphere;" 5, "Observations of Halley's Comet (as seen at the Cape toward the close of 1835), with Remarks on its Physical Condition and that of Comets in general;" 6, "Observations of the Satellites of Saturn;" 7, "Observations of Solar Spots." His residence at the Cape gave not only valuable additions to astronomy, but also to meteorology. He suggested the plan of taking simultaneous meteorological observations at different places on given days, and embodied his views on the plan in his "Instructions for Making and Registering Meteorological Observations at various Stations in Southern Africa" (1844). Before going to the Cape of Good Hope he added 800 nebulae to the catalogue of his father, and on his return published a catalogue of 2,049 nebulae of the southern hemisphere and their positions, 500 of which were before entirely unknown. He also added, while at the Cape, 1,081 double stars, and in measuring the angles of positions and the distances of the stars from each other, found that many of them have very rapid orbital motions. He made many interesting observations on the milky way. "This remarkable belt," he says, "examined through a powerful telescope, is found (wonderful to relate) to consist entirely of stars scattered by millions, like glittering dust, on the black ground of the general heavens." Again, he conjectures from his ingenious combinations of photometric calculations, that if the stars in the great circle of the milky way, which he saw in his 20 feet reflecting telescope, were newly risen luminous cosmical bodies, it would require 2,000 years for a ray of their light to reach us. His observations on the brightness and the color of stars, on variable stars, on the sun's rays, on the atmospheric air, and on the Magellanic clouds, are all very valuable. He gives the whole number of stars

registered, down to the 7th magnitude inclusive, as from 12,000 to 15,000. He calculated the thickness of Saturn's ring, and made it to be not much over 100 miles, a very interesting fact, when we consider that the breadth of the ring is 33,360 miles, and its distance from the planet over 22,200 miles. Sir John Herschel did not confine his attention to astronomy. He calculated the density of the atmosphere, and, calling its density at the surface of the earth unity, found that, under any hypothesis as to its atoms, it "would require a fraction having at least 1,370 figures in its denominator to express its tenuity in the interplanetary space." Again, the strata of the atmosphere being of uniform density at equal heights above the level of the sea, and its density diminishing, as it is both heavy and elastic, in ascending, the upper strata are less dense than the lower ones. Now, if the temperature is constant, and heights above the earth are taken increasing in arithmetical proportion, it ought to follow that the densities of the strata of air will decrease in geometrical proportion. Sir John Herschel, however, has shown that the decrease is much more rapid, and that a perfect vacuum exists at the height of 80 or 90 miles above the earth, and also that three fourths of all the atmospheric air is within 4 miles of the earth's surface. He also computed the mean temperature of space to be -239° F. The question concerning the absorption of light, which gave rise to much discussion, particularly in its connection with the undulatory theory of light, was very ably answered by Herschel in his paper on the "Absorption of Light by Colored Media." He has made some important discoveries in photography, and produced from chemical compounds and the juices of plants the most beautiful chromatic effects. Sir John Herschel contributed to the "Manual of Scientific Inquiry" (1849 and 1851), and wrote "Outlines of Astronomy" (1850; new ed. 1858), and "Essays, from the Edinburgh and Quarterly Reviews, with Addresses and other Pieces" (1857). During the year 1848 he filled the chair of president of the royal astronomical society. In 1850 he was appointed master of the mint, which office he held till 1855, when his health made it advisable for him to resign. In 1855 he was nominated to the distinguished honorary position of one of 8 foreign associates of the French academy of science. His authority in scientific matters is universally respected, and while his numerous observations and discoveries will always make his name a great one in the annals of science, his unambitious pursuit of truth has earned for him the esteem and good will of his contemporaries.

HERSCHEL, SIR WILLIAM, an English astronomer, born in Hanover, Nov. 15, 1738, died in Slough, near Windsor, Aug. 23, 1822. His father, a musician, educated him to his own profession, and at the age of 14 placed him in the band of the Hanoverian foot guards. In 1757 he went to England to seek his fortune, and here for some years he devoted himself to

music for his support. He is said to have been engaged in military bands and at concerts, but there is much confusion in the stories relating to this period of his life. It is certain, however, that he earned his living by music. He was engaged near Leeds, and at Doncaster and Pontefract, in concerts and oratorios. Afterward he became organist at Halifax, and in 1766 organist at the Octagon chapel in Bath. In the latter place he first turned his attention to the study of astronomy, particularly to the construction of optical instruments. In 1774 he had constructed for himself a large reflecting telescope. As an optician alone, Herschel would have earned a great reputation, by the immense improvements which he effected in the size and magnifying power of the telescope. While at Bath he constructed no fewer than 200 Newtonian telescopes of 7 feet focus, 150 of 10 feet, and about 80 of 20 feet, and did far more than any one who had preceded him in uniting to the best advantage the magnifying power and the illuminating power of the telescope. Either one of these qualities may easily be strengthened, but at the expense of the other, and the exact proportion in which they must be united to render the greatest amount of light effective was a problem which required the closest calculation and the most careful experiments to solve. With one telescope, magnifying 227 times, Herschel began a careful survey of all the stars, serially; and while examining the constellation of Gemini, he noticed (March 13, 1781) that one of them appeared unusually large, and a second examination of it showed it to be also out of place. Finally he pronounced it to be a comet, and it was so published in the "Philosophical Transactions" (1781). This announcement drew the attention of astronomers to the supposed comet, and they began to endeavor to compute its course. The president Saron first pronounced it to be a planet, and then Lexell and Laplace, almost simultaneously, computed its elements, and found it to have an elliptical orbit, whose great axis was about 19 times greater than that of the earth, and the period of its revolution to be 84 years. Herschel had taken no part in the mathematical calculations, but on its being pronounced a planet, he proposed to name it the Georgium Sidus. It has often been called Herschel in honor of its discoverer, but the name Uranus, applied to it by Bode, has been generally adopted. Herschel now turned his attention most carefully to this planet, determined the apparent diameter (about $4''$) for its mean distance from the earth, and discovered its 6 satellites, revolving in a plane nearly perpendicular (at an angle of $78^{\circ} 58'$) to its orbit, and contrary to the order of signs (that is, from east to west). These important discoveries attracted the attention of all Europe, and Herschel received from George III. a pension of £400 and a house near Windsor, first at Datchet, and finally at Slough. With funds advanced by the king, Herschel constructed his celebrated

40 feet reflecting telescope, the useful speculum of which was 4 feet in diameter, $3\frac{1}{2}$ inches thick, and over 2,000 lbs. in weight. The plane mirror of the instrument was dispensed with, and the observer sat in a swinging chair with his back to the object observed, and facing the object end of the tube, in which the image, by an inclination of the speculum, was thrown to one side and observed through a single lens. He conjectured that with this instrument 18,000,000 stars might be seen in the milky way. —Though Herschel added an almost unprecedented number of new bodies to the planetary system, yet his glory is greatest in sidereal astronomy, of which he laid almost the foundations. His leading discoveries in this branch of the science were the following: I. The binary systems of stars, and the orbits of several revolving stars. Double stars had been noticed even before the introduction of the telescope; but while Herschel was observing them to learn their annual parallax, he noticed a steadily increasing change in their position and distance; and in 1802, 23 years after he began his observations, he announced in the "Philosophical Transactions" his discovery that both stars were continually circulating round their common centre of gravity, and all his instances have been confirmed. II. He classified the nebulae, and advocated the nebular hypothesis, since disproved by the discoveries made with the great telescope of Lord Rosse. He discovered that these nebulous spots cover at least $\frac{1}{3}$ of the visible firmament, and in 1802 he indicated the positions of 2,500 nebulae or clusters of stars. He classified them as: 1, clusters of stars; 2, nebulae proper; 3, nebulous stars. In his nebular hypothesis ("Philosophical Transactions," 1811) he supposes the starry matter to have been once in a state of indefinite diffusion, and that it has been, during "an eternity of past duration," "breaking up" by condensation toward centres more or less remote; that the milky way is a relic of this former state of things; that where condensation has gone on more energetically, we have nebulae with a gradually or rapidly increasing brightness toward the centre; if still more energetic, a nucleus, or a planetary nebula; next a nebulous star, which he supposes our sun to be, and the zodiacal light a relic of its nebula; and finally the completely formed stars may be assumed to be merely consolidated nebulae. III. The law of grouping the entire visible firmament. He "gauged" the heavens, by counting the whole number of stars visible in the field of his 20 feet reflector, and, taking the average for each region, determined thus the general population of the sky. The result showed a remarkable and steady law of decrease, from the central zone of the milky way in opposite directions to the northern and southern poles. This discovery assigned a law to the distribution of all the visible bodies of the universe in space. IV. The determination of the fact of the motion of our system, and the direction of that motion. It was already

known that the stars were not fixed, but had a proper motion. Herschel, from the proper motions of about 20 stars, with great penetration, divined that our system was moving in the direction of λ Herculis, a point whose right ascension is 270° , and north declination 25° . Beside discovering the satellites of his own planet, Herschel discovered two new satellites of Saturn, now called, from their being next the ring, the first and second, and determined the rotation of the rings of the planet to be in 10 h. 32 m. He found also that the time of the rotation of the satellites of Jupiter was just equal to the period of their revolution about the planet. When his age made it advisable for him to discontinue his observations in the heavens, he turned his attention to the properties of heat and light. He also gave some valuable opinions concerning the spots on the sun, attributing them to occasional openings in the luminous coating, which seems to be always in motion.—Sir William Herschel married, in 1788, Mrs. Mary Pitt, a widow lady of considerable fortune, and had by her one son, John, whose name is no less distinguished in the annals of science than that of his father. Miss Caroline Herschel was also his constant companion and assistant at Slough. Herschel contributed papers, sometimes several in a year, to the "Philosophical Transactions" from 1780 to 1815.

HERTFORD, a N. E. co. of N. C., bordering on Va., bounded E. by Chowan and Nottoway rivers, and intersected by the Meherrin, which unites with the Nottoway to form the Chowan; area, 320 sq. m.; pop. in 1850, 8,142, of whom 3,716 were slaves. It has a level surface, covered in part with pine and cedar woods, which furnish large quantities of timber, tar, and turpentine for exportation. The agricultural productions in 1850 were 288,805 bushels of Indian corn, 97,055 of sweet potatoes, and 270 bales of cotton. There were 6 grist mills, 5 saw mills, and 11 churches. The Chowan river is navigable by sloops along the border of the county. Organized in 1759, and named after the marquis of Hertford. Capital, Winton.

HERTFORDSHIRE, or HERTS, an inland co. of England, bounded N. by Cambridgeshire, E. by Essex, S. by Middlesex, and W. by Buckinghamshire and Bedfordshire; area, 611 sq. m.; pop. in 1851, 167,298. Its principal rivers are the Colne and Lea with their tributaries, affluents of the Thames, and some smaller streams flowing to the Ouse. Part of the New river, which supplies London with water, is within the shire, and is conducted by an aqueduct along the valley of the Lea. The Grand Junction canal passes through the county. It is also traversed by the London and North-Western and Great Northern railways, while the Eastern Counties railway skirts the S. E. boundary. Agriculture is the principal occupation of the people. There are many Roman and other antiquities, of which the most prominent are St. Alban's abbey and the ruins of Berkhamstead castle, and Royston church and cave. Hertfordshire returns 5 mem-

bers to parliament, namely, 3 for the county, and 2 from the town of Hertford.

HERTHA, ÆRTHA, or HERTHUS, the goddess of earth, anciently worshipped by the Æstii, Lombards, Angles, and many other Germanic tribes established below the Elbe, and in the regions of the Baltic. The name and nature of the divinity correspond to the Airtha of the Goths, the Eorthe of the Anglo-Saxons, the old German Erda, and the Latin Terra. The Scandinavians called her Jord; according to them she was daughter of Annar and of Night, sister of Dagur or Day by the mother's side, wife of Odin, and mother of Thor, and thought to be the same as Frigga. The myth is one found in all religions, of the identification of the female principle, or of generation and fertility, with the earth. The earth being the all-nourishing mother, it was naturally believed that Hertha sympathized with mankind, and the myth of the revival of spring gradually became for the vulgar a faith that she visited them in person at stated times. These visits took place, according to Tacitus, on a sacred island in the Baltic, where the chariot of Hertha was kept. When the goddess had descended from the throne of Odin, she was believed to take her seat in the chariot. Heifers were then harnessed to it, and she was drawn amid festivity over the land. Finally the goddess, or rather her wagon, on returning to the holy grove, was washed in the sea by slaves who were immediately after drowned. This appearance of Hertha was also practised in another form among certain German tribes, with whom it was usual on occasions of drought to take the most beautiful maiden of the village, and send her entirely naked at the head of a female procession over the fields. As Hertha is the most interesting of German myths, much pains has been taken by antiquaries to ascertain the place where these rites were performed. For a long time this was believed to be the island of Rügen, but recent researches render it more probable that it was in Helgoland, Seeland, or Laland. In these latter the legend of the goddess is still preserved as matter of tradition, and her sacred groves and lakes are still shown.

HERULI, or ERULI, a German tribe, which in the latter part of the 3d century appeared on the shores of the Euxine, having joined the Goths in their invasion of the Danubian provinces of the Roman empire. They were afterward conquered by the Ostrogoths, followed Attila on his march to Gaul (451), and after his death (453), uniting with other German tribes, were powerful enough to destroy the western empire under their leader Odoacer, who assumed the title of king of Italy (476), but finally succumbed to the Ostrogoths under Theodoric (493). Another kingdom of the Heruli, founded in the central part of modern Hungary, was destroyed by the Lombards.

HERVEY, JAMES, an English clergyman and author, born in Hardington, near Northampton, Feb. 26, 1713, died Dec. 25, 1758. He was

graduated at Oxford, took orders in the established church at the age of 22, was appointed curate to his father, afterward removed to Biddeford, and on the death of his father, in 1750, succeeded to his two livings at Weston Favell and Collingtree. He was noted for his benevolence, and was a good scholar, being well skilled in Hebrew, Greek, and Latin. In 1746 he published his "Meditations and Contemplations," which have been widely read and admired. In 1753 appeared his "Remarks on Lord Bolingbroke's Letters on History;" in 1755, his "Theron and Aspasio," a work on the Calvinistic theory of redemption. Beside sermons, and the works already mentioned, he published letters to Wesley and to Lady Frances Shirley, and edited, with a preface, Burnham's "Pious Memorials," and Jenks's "Devotions." His works, with a memoir of his life, were published in 1797 (7 vols. 8vo., London), and have passed through numerous editions.

HERVEY, JOHN, Baron Hervey of Ickworth, an English politician and poet, born Oct. 15, 1696, died Aug. 5, 1743. He was the eldest son of John Hervey, first earl of Bristol of that name. He studied at Cambridge, and was appointed in 1716 gentleman of the bedchamber to the prince of Wales. He acquired at court a reputation for gallantry which excited the jealousy of Chesterfield. He was looked upon as the most accomplished man of his time, and by his talents, literary tastes, and family connections was an important auxiliary to Sir Robert Walpole. An intimate friend of the king, queen, and prime minister, and believed to sustain still more confidential and delicate relations with the princess Caroline, Hervey's position was greatly envied. In 1730 he was appointed vice-chamberlain and privy councillor, and in 1733 raised to the peerage. He lost much influence on the death of the queen in 1737, but entered the cabinet, and received in 1740 the privy seal, which he lost, however, on the fall of Walpole. He was an epileptic, and his life was protracted only by great watchfulness. Hervey is the *Sporus* ridiculed by Pope in the prologue to the "Satires" as

—That thing of silk,
Sporus, that mere white curd of ass's milk;

but he was, notwithstanding the disgrace which the attack has attached to his name, a man of intelligence and kind heart. His most important work is the posthumous "Memoirs of the Court of George II. and Queen Caroline," edited by J. W. Croker (2 vols. 8vo., 1848; new ed. 1854).

HERVEY, THOMAS KIBBLE, a British author, born in Paisley, Scotland, Feb. 4, 1799, died in Kentish Town, Feb. 17, 1859. He removed with his father to Manchester in 1803, and in 1818 entered Trinity college, Cambridge, but left the university about 1820 without taking a degree. Subsequently he entered the office of a special pleader, but after a short time relinquished his legal studies and adopted literature as a profession. His first publication was "Australia," originally commenced as a college prize poem,

but subsequently enlarged to the dimensions of an epic, and republished for a 3d time in 1827, with some additional lyrics of considerable merit. Among his other poetical works are, "Illustrations of Modern Sculpture," the "Poetical Sketch Book," the "Book of Christmas," a satire entitled "The Devil's Progress," &c. He was for a long time editor of the "Literary Souvenir" and "Friendship's Offering," which contained some of his minor poems, such as "The Convict Ship" and "Cleopatra on the Cydnus," and a number of popular tales. For 20 years previous to 1854 he was a leading contributor to the "Athenæum," and for the last 8 years of that term he was its sole editor.—**ELEANORA LOUISA (MONTAGU)**, wife of the preceding, and an authoress, born in Liverpool in 1811. At a comparatively early age she became a contributor to the annuals and periodicals, and was favorably known as a graceful and vigorous writer of verse. In 1839 she produced "The Landgrave," a dramatic poem, and 4 years later became the wife of Thomas K. Hervey. Since her marriage she has written "Margaret Russell," the "Double Claim," the "Juvenile Calendar, or the Zodiac of Flowers," a series of fairy legends illustrated by Doyle, and the "Pathway of the Fawn."

HERWEGH, GEORG, a German poet, born in Stuttgart, May 31, 1817. He studied theology at the university of Tübingen, but devoting himself to literature, became a contributor to magazines, and attracted attention in 1841 by the publication of his *Gedichte eines Lebendigen*—poems of a liberal political tendency and of great lyrical merits, which passed through 7 editions within 2 years. During a journey through Germany, he was received with great distinction by many eminent persons, including the king of Prussia, but was expelled from the Prussian territory on account of a letter which he addressed to the king. He was also expelled from Zürich, where he had previously resided, but found an asylum in the canton of Basel. Having subsequently resided in Paris, he put himself, soon after the French revolution of 1848, at the head of a legion of French and German laborers, crossed the Rhine in order to revolutionize Germany, and appeared in Baden in April, but was defeated by the Würtemberg troops, and compelled to flee with his wife, who shared the toils of the expedition, to Switzerland, where he still resides. He has translated Lamartine's complete works into German (12 vols., Stuttgart, 1842), and has published, beside other writings, a new collection of poems under the title of *Xenien*, which however is far inferior to his first work upon which his fame rests.

HERZ, HENRI, a German composer and pianist, born of Jewish parents in Vienna, Jan. 6, 1806. Having evinced a considerable talent for music, he was placed at 10 years of age at the *conservatoire* of Paris, and 2 years later produced his first compositions for the piano. His productions now number considerably over

200, and include concertos, trios, and other elaborate forms of composition, together with fantasias, variations, &c., remarkable for elegance. He has also prepared a pianoforte method. After numerous concert tours in all parts of Europe, he made a professional visit to the United States in 1846-'7. He has invented an instrument called the *dactylon* to form the hand for pianoforte playing.

HERZ, HENRIETTA, a German lady distinguished for beauty, accomplishments, and social influence, born in Berlin, Sept. 5, 1764, died Oct. 22, 1847. She was the daughter of a Jewish physician, De Lemos, and received an irregular but extremely varied education. She was married, Dec. 1, 1779, to Marcus Herz, an eminent physician. Owing to her extraordinary beauty and intelligence, her house soon became the scene of the most distinguished reunions ever witnessed in Berlin. Spalding, Dohm, Engel, Ramler, the Humboldts, Friedrich von Schlegel, Gentz, Schadow, Reichardt, and Moritz were among her most intimate guests. Börne passed a portion of his youth in her house, and owed much of his mental development to her, while she maintained for a long time the most intimate intellectual correspondence with the theologian Schleiermacher. She became a widow in 1803, and sustained reverses of fortune, which did not, however, diminish her social influence. She declined at this time an invitation to undertake the tuition of the Prussian princess Charlotte, afterward empress of Russia, as this would have made a change of faith necessary. After the death of her mother, however, she became a Christian. She was distinguished to the last by unwearied benevolence and a wide range of correspondence with eminent men and women. In 1845 she obtained a pension through the influence of Alexander von Humboldt. She had no children. She destroyed in her later years her immense collection of letters. Her literary efforts were confined to a few translations of English books of travel.

HERZEGOVINA, or **HERSEK**, a province of European Turkey, forming the S. W. part of the eyalet of Bosnia, bounded N. by Croatia, W. by Dalmatia, S. by Montenegro and the gulf of Cattaro, and E. by Bosnia proper; area, about 7,000 sq. m.; pop. nearly 200,000, about half of whom are Mohammedans, and the rest equally divided between the Greek and Latin churches. They are chiefly of the Slavic race, and speak a Slavic dialect. The province is covered by a branch of the Dinic Alps, and traversed by the Marenta and its tributaries, which flow into the Adriatic. The principal product is tobacco of very fine quality. The most notable manufactures are hydromel or mead, a favorite popular beverage, and sword blades.—The province formerly belonged to the kingdom of Croatia, and was often called the country of Chulm, and by the Venetians the duchy of St. Saba, in honor of that saint. Annexed to Bosnia in the early part of the 14th century, it was wrested from it by the emperor

Frederic III. (died 1329), who disposed of it in favor of Stefan Ilranich or Cossac and his descendants, as an independent duchy. Hence the name of Herzegovina, the title of Herzog (duke) having been borne by its princes before the Ottoman conquest, which took place in 1466 under Mohammed II. After various contests, the Turks were confirmed in its possession by the treaty of Carlovitz (Jan. 26, 1699), excepting the former capital, the fortified town of Castelnovo, in the gulf of Cattaro, and a small territory, which had been held by the Venetians since 1682, and which now forms part of the Austrian kingdom of Dalmatia. The Herzegovina is divided into 13 departments, and is governed by a vizier. Capital, Mostar.

HERZEN, ALEXANDER, a Russian publicist, born in Moscow in 1812. His mother was a native of Stuttgart, who clandestinely left her parents' home to accompany her husband to Russia. After leaving the university Alexander was arrested on the charge of having been concerned in singing a seditious song, was condemned to serve the state under surveillance, and was exiled to Viatka. The death of his father in 1846 left him wealthy, and he departed for Italy and France. Having been connected with the revolutionists in Paris in 1848, his property was in part confiscated, and he took refuge in England, after distinguishing himself as a writer in France and in Germany. Here he became director of an independent Russian press, and editor of the *Kolokol* ("The Bell"), a newspaper exerting great influence in Russia, into which country it is extensively smuggled, and from which it receives correspondence, in many instances proving an efficient check upon Russian official corruption. Herzen's principal works are his *Briefe aus Italien und Frankreich* (Hamburg, 1850); *Vom andern Ufer* (Berlin, 1850); his memoirs, translated and published in London as "My Exile" (1855); *Polyarnaya Zvezda* (the "Polar Star"), a Russian periodical printed in London for the purpose of publishing the suppressed poems of Pushkin, Lermontoff, and others, and of introducing into Russia the views of the latest liberal European politicians; and *Prevrannie Razskazi* ("Interrupted Tales," London, 1856), consisting of articles cut down by the censor in Russia with the full reading restored. Several of his works in French and Russian on the condition of the serfs in Russia and the social condition of the people are said to have exerted an important influence on the recent question of emancipation. In 1858 he published in London and Paris a pamphlet in English and French entitled "France or England?" cautioning Russia against an alliance with Louis Napoleon. His last work, the edition of the "Memoirs of Catherine II." (London, 1859), in French and English, has caused some controversy in the English press. He resides near London, and is assisted in his labors by the Russian poet Ugarcieff.

HESIOD (Gr. Ἡσίοδος), one of the earliest Greek poets, the representative of the Bæotian,

as Homer was of the Ionic school of epic poetry. Nothing is known of his life except that he dwelt at Ascræ, on Mt. Helicon, whither his father had removed from Cyme, on the Æolic coast of Asia Minor. The most general opinion of the ancients assigns Homer and Hesiod to the same period, which Herodotus fixes at about 850 B. C.; the higher antiquity of Hesiod is maintained by Ephorus of Cyme, and that of Homer by Xenophanes of Colophon, Paterculus, and most modern critics. K. O. Müller opposes the common opinion that the epic language was first formed in Asia Minor, whence it was borrowed and transferred to other subjects by Hesiod. He supposes, on the contrary, that this poetical dialect had already come into use in the mother country before the Ionic colonies were founded, and that the phrases, epithets, and proverbial expressions common to the two schools of poetry were derived from a common and more ancient source. The Hesiodic and Homeric poetry resemble each other only in dialect and form, and are completely unlike in their genius and subjects, the latter treating the thoughts and actions of the heroic age, the former striving to reduce the bewildering legends about gods and heroes to a connected and comprehensible system. Its tone is always sombre and ethical. The logographers related numerous stories of Hesiod, of his descent from Orpheus, his gift of prophecy, and his contest with Homer, which show that an early connection was conceived to have existed between the priests and bards of Thrace and Bæotia, out of which grew the elements of his poetry. The Hesiodic poetry flourished chiefly in Bæotia, Phocis, and Eubœa, and the eminence of Hesiod caused a great variety of works to be attributed to him. The "Works and Days" (*Ἔργα καὶ ἡμέραι*), the only poem which his countrymen considered genuine, is perhaps the most ancient specimen of didactic poetry, and consists of ethical, political, and minute economical precepts. It is in a homely and unimaginative style, but is impressed throughout with a lofty and solemn feeling, founded on the idea that the gods have ordained justice among men, have made labor the only road to prosperity, and have so ordered the year that every work has its appointed season, the sign of which may be discerned. The "Theogony" (*Θεογονία*) is an attempt to form the Greek legends concerning the gods into a complete and harmonious picture of their origin and powers, and into a sort of religious code. Beginning with Chaos, out of which rose first the Earth and Eros (love), the fairest of the immortal divinities, it completes the formation of the world, and relates the genealogies and wars of the gods and heroes, and the triumph of Zeus and the Olympians over the Titans. It was esteemed by the Greeks of high authority in theological matters, and philosophers sought by various interpretations to make it harmonize with their own theories. Another poem attributed to Hesiod was the "Heroines" (*Ἡοῖαι*), giving accounts of the

women who by their connection with the gods had become the mothers of the most illustrious heroes, and containing a description of the shield of Hercules, which is all of it that is still extant. Several other Hesiodic poems are mentioned by the ancients. The best complete edition is that of Götting (8vo., Gotha and Erfurt, 1843); and the scholia on him of the Neo-Platonist Proclus, and others, are contained in Gaisford's *Poetæ Græci Minores*, vol. iii. The "Works and Days" was translated into English by George Chapman (London, 1618). A poetical translation was made by C. A. Elton (London, 1810), and a prose version by the Rev. J. Banks, in Bohn's "Classical Library" (London, 1856).

HESPERIDES, in Grecian mythology, the guardians of the golden apples which Terra gave to Juno as a wedding gift. Sometimes they are called the daughters of Erebus and Night, sometimes of Atlas and Hesperis, sometimes of Jupiter and Themis. Some traditions make them 3, others 4, and others again 7. They were commonly, however, set down at 4, whose names were Ægle, Erythia, Hestia, and Arethusa. Their gardens were originally placed in the remote west, about Libya and Mt. Atlas, but later mythologists placed them in Cyrenaica, and some even in the extreme north among the Hyperboreans. Their great duty was to guard the apples which Juno had committed to their care, but Hercules succeeded in obtaining them by the assistance of Atlas.

HESS, HEINRICH, baron, an Austrian general, born in Vienna in 1788. He entered the army in 1805, served with distinction during the campaign of 1813-'14, and was eventually promoted to the rank of lieutenant field marshal (1842). Sent as quartermaster-general to the army of Italy in 1848, he greatly contributed, as chief adviser of the old general Radetzky, to his successes in the campaign of that and the following years. The emperor Francis Joseph rewarded him with the title of privy councillor and the appointment of chief of the staff of the whole army. He concluded the convention of 1854 with Prussia, and soon after received the chief command of the great army concentrated on the eastern boundary of the empire. During the war in Italy in 1859 he again acted as head of the staff after the dismissal of Gyalui from the chief command, which he received himself after the battle of Solferino (June 24), when he was active in bringing about the agreement of Villafranca (July 11).

HESS, KARL ERNST CHRISTOPH, a German engraver, born in Darmstadt in 1755, died in 1828. He first made himself known by some plates after pictures by Rembrandt in the gallery at Düsseldorf, and subsequently engraved a large portion of the gallery for a pictorial work. His engravings, principally from the old masters, are much esteemed.—PETER VON, eldest son of the preceding, a painter of *genre* and battle pieces, born at Düsseldorf, July 29, 1792. In 1813-'15, while on the staff of Prince Wrede, he participated in the most considerable actions

against the French, and made sketches of incidents on the spot. These he afterward embodied in a series of battle pieces, of which the "Battle of Arcis-sur-Aube," the "Capture of a French Village by Cossacks," the "Bivouac of Austrian Troops," and the "Battle of Leipzig," are good specimens. He has lately executed for the ex-king Louis of Bavaria a series of 39 pictures illustrating the Grecian struggle for independence, for which purpose he has several times visited Greece, having previously painted for the czar of Russia a series of 12 illustrating the events of 1812. He has been called the Horace Vernet of Germany.—HEINRICH VON, brother of the preceding, a historical painter, born at Düsseldorf, April 19, 1798. After preparatory studies at Rome, at the invitation of the king of Bavaria he prepared the cartoons for the decoration of the church of All Saints in Munich, in which the progress of Christianity is unfolded. He subsequently painted for the basilica of St. Boniface in the same city 64 compositions in fresco, with figures of colossal size, illustrating the life of the saint, and has executed a number of other works for churches of an equally impressive character.

HESSE, or HESSIA (Germ. *Hessen*), a territory of Germany, inhabited in the time of the Roman empire by the Catti or Chatti, an old Germanic tribe. Germanicus is said to have destroyed their principal town, Mattium, which stood on the site of the present villages of Gross- und Kleinmaden, near Gudensberg. Under the Frankish kings Hesse was governed by counts. The principal of these were the counts of Gudensberg of the name of Giso. By the marriage of the heiress of the last count of Gudensberg, Giso IV., with the landgrave Louis I. of Thuringia, this prince became sovereign of Hesse. Till about the middle of the 13th century the history of Hesse was identical with that of Thuringia; but the landgrave Henry Raspe dying without issue in 1247, his niece Sophia, the daughter of the landgrave Louis the Pious and the wife of Henry, duke of Brabant, claimed Hesse as well as Thuringia; and after a war of succession with her cousin, the margrave Henry the Worshipful of Meissen, she was put in possession of Hesse by treaty in 1263. Sophia's son, Henry I. the Child (died 1309), became the progenitor of the dynasty of Hesse, and took up his residence at Cassel. Philip I. the Generous, who succeeded his father William II. in his sovereignty of the whole country in 1509, and who was the first to introduce the reformation, divided his dominions among his 4 sons. The eldest, William IV., obtained one half, including the capital Cassel; Louis IV. one fourth, comprising Marburg; Philip II. one eighth, with Rheinfels; and George I. also one eighth, with Darmstadt. But Philip II. dying in 1583, and Louis IV. in 1604, without children, there remained only the two still existing main branches of Hesse-Cassel and Hesse-Darmstadt. Among the other princes

of the Hessian dynasty are the landgraves of Hesse-Philippsthal, of Barchfeld, and of Hesse-Rheinfels-Rothenburg.

HESSE-CASSEL (Germ. *Kurhessen*), a German electorate, bounded by Hanover, Prussian Saxony, Weimar, Bavaria, Nassau, Hesse-Darmstadt, Waldeck, and Westphalia; area, 4,420 sq. m.; pop. in 1856, 736,392. The most populous province is that of Lower Hesse, which comprises the county of Schaumburg. The other provinces are Upper Hesse, Fulda, and Hanau. The country is hilly, and the soil generally not fertile, except in Fulda. Among the principal mountains are branches of the Thuringian forest (on which Schmalkalden, a detached possession of Hesse-Cassel, is situated), the Spessart, the Rhön, the Hundsrück, the Wesergebirge, and the Vogelsgebirge. The principal rivers are the Werra, Fulda, Weser, Lahn, and Main. The climate is temperate; mildest on the banks of the last named river, and most rigorous on the summit of the Rhön. Grain, especially buckwheat, is produced, with potatoes, pulse, large quantities of flax, some hemp and tobacco, chicory, fruit, a small amount of wine, and much timber. The mineral productions are copper, iron, quicksilver, cobalt, salt (from numerous saline springs), saltpetre, vitriol, alum; also coal, marble, white alabaster, porcelain clay, potters' earth, pipe clay, &c. The principal manufactures are linen, flannel, carpets, silks, velvets, jewelry, cotton, paper, musical instruments, chemical products, beet root sugar, tobacco, wooden ware, &c. Schmalkalden manufactures almost all the steel and iron of the country; and Grossalmerode is noted for its pottery and crucibles. The manufacturing industry has much increased since 1832, when Hesse-Cassel joined the *Zollverein*. The Weser and Main are navigable, and for smaller vessels also the Werra and Fulda. Commerce is carried on by these rivers, and by the railways which connect the country with the other portions of Germany. Hesse-Cassel possesses many educational institutions, the principal of which is the university of Marburg. A large proportion of the population are connected with the Reformed church, but there are about 160,000 Lutherans, 100,000 Roman Catholics (under the bishop of Fulda), 15,000 Jews (emancipated since 1833), and 270 Mennonites. The dialects spoken are low German along the banks of the Diemel, Hessian high German on those of the Werra and Fulda, and Rhenish high German on the Lahn and Kinzig. The principal towns are Hanau and the capital, Cassel.—Hesse-Cassel occupies the 8th place in the German confederation, and has 3 votes in the general assembly. The revenue and expenditures for the 3 years from 1858 to 1860 are estimated respectively at about 5,000,000 Prussian thalers. The public debt amounts to about 11,000,000, chiefly for railways. The army comprises about 15,000 men. The theory of government is that of a constitutional monarchy. The sovereign retains the old title of elector or prince elector (*Kurfürst*). His dignity is hereditary,

with exclusion of females. He is assisted by a council of ministers, who are responsible. The people are represented in two chambers.—Hesse-Cassel is the elder branch of the Hesse dynasty, and was founded by the eldest son of Philip the Generous, the landgrave William IV., surnamed the Wise (1567 to 1592). His grandson, William V., took part in the 30 years' war, and his widow obtained, after the restoration of peace, the greater part of Schaumburg and other territory. William VII. was succeeded in 1670 by his brother Charles, while another brother, Philip, founded the branch of Hesse-Philippsthal. Charles's eldest son became, by his marriage with Ulrike Eleonore, king of Sweden in 1720. In 1730 he assumed the government of his native country as Frederic I., and was succeeded in 1751 by his brother William VIII., who fought in the 7 years' war on the side of Prussia. His son, the notorious Frederic II., became a convert to the church of Rome, and between 1776 and 1784, received over £3,000,000 by hiring his soldiers to the English government to fight against the Americans in the war of independence. He died in 1785, and was succeeded by his son William IX., who after 1803, when he was raised to the rank of an elector, reigned under the name of William I. Although recognized by Napoleon as one of the neutral princes in 1806, he was expelled from his possessions after the battle of Jena, and Hesse-Cassel was incorporated with the kingdom of Westphalia. On his return to power in 1813, he restored the old order of things. He is identified with the rise of the Rothschilds. During the Napoleonic wars he deposited his large property with Mayer Amshel Rothschild, a Jewish money-changer of Frankfort, who acquitted himself of this trust with so much skill and honesty, that the prince afterward afforded him facilities which, together with the peculiar financial tact of the elder Rothschild, laid the foundation of the great wealth and influence of his house. This same prince was the father of the notorious Austrian general Haynau, by his mistress Frau von Lindenthal. He was not popular with his subjects. On his death in 1821 he was succeeded by his son, the elector William II., whose relation with his subjects became seriously complicated by his connection with the obnoxious countess of Reichenbach. Riots broke out in 1830. The countess left Cassel, and on Jan. 9, 1831, the elector promulgated the long promised liberal constitution. On the return of the countess fresh disturbances arose, which incensed the elector to such an extent that he also left Cassel. He retired to Frankfort, where after the death of his legitimate wife (1841), the electress Auguste, he contracted a morganatic marriage with his mistress, and, 6 months after her decease in Feb. 1843, with Karoline von Berlepsch. On his death in 1847 he was succeeded by his son, who had officiated as regent after his departure from Cassel, and who assumed the sovereignty under the name

of Frederic William I. (born Aug. 20, 1802; married to Gertrude, princess of Hanau, countess of Schaumburg). The heir apparent to his throne is his son Frederic William, born Nov. 18, 1832. Yielding in 1848 to the revolutionary demand for political reforms, but retracing his steps after the reaction had set in, he gave great dissatisfaction to the people, especially in 1850, when the unpopular minister Hassenpflug came into power as premier, and Haynau, a nephew of the Austrian general, as minister of war. So great became the excitement of the people that the elector sought refuge in flight, and Hassenpflug saw no other means of saving the crown than by invoking the aid of the other German powers. By their military interference quiet was restored, and by their negotiation a new constitution was promulgated in 1852, which however met with much opposition on account of its illiberality. After protracted agitations on the subject, a proposal in favor of the reestablishment of the old constitution was presented to the electors by a vote of the second chamber, Nov. 5, 1859. During the war excitement in 1859, the chambers unanimously voted to join the Austrians against Napoleon III.

HESSÉ-DARMSTADT, a German grand duchy, consisting of two large portions, separated by a long strip of land extending from E. to W., which belongs to Hesse-Cassel and to the free city of Frankfurt. The N. portion is bounded W. by Nassau and Prussia, and N. E. and S. by Hesse-Cassel; the S. portion is bounded N. by Nassau, Frankfurt, and Hesse-Cassel, E. by Bavaria, S. by Baden, S. W. by Rhenish Bavaria, and W. by Prussia. Area, 3,231 sq. m.; pop. in 1859, 845,571, of whom about 218,000 are Roman Catholics, 29,000 Jews, and the rest Protestants. It is divided into 3 provinces, Upper Hesse, Starkenburg, and Rhenish Hesse. The principal mountains are the Odenwald and the Vogelsgebirge. The Vogelsgebirge is a volcanic mass, occupying with its branches about 400 sq. m. The country is also traversed by branches of the Westerwald, Taunus, &c. The chief rivers are the Rhine, Main, Nahe, Nidda, and Lahn. Hesse-Darmstadt is one of the best cultivated agricultural countries in Germany. Offenbach, near Frankfurt, is the chief manufacturing town. Mentz is the great emporium for the corn, wine, and transit trade. Darmstadt is the capital. The grand duchy possesses many railways and excellent public roads. It occupies the 9th rank in the German confederation, has 3 votes in the full and one in the minor council, and furnishes a contingent of 6,195 men; in 1859 the whole army comprised 10,621 men.—The government is a constitutional monarchy. The grand duke, who bears the title of *Grossherzog von Hessen und bei Rhein*, is assisted by a council of state and a cabinet, which consists of the premier or president (who is at the same time minister of the grand ducal household), of the minister of the interior and of foreign affairs, and

of the ministers of justice, finance, and war. The legislature is composed of two chambers. The annual receipts and expenditures amount respectively, according to the budget of 1857-'9, to about \$400,000. The public debt of \$7,000,000 comprises about \$5,000,000 due for railways and loans made in 1857 and 1859. The grand duchy possesses 1,600 elementary, 6 primary, and 2 normal schools, 7 gymnasia and *Pädagogien*, 2 Protestant divinity schools, an academy for studies relating to woods and forests, many other private educational institutions, and the famous university of Giessen.—The line of Hesse-Darmstadt was founded in 1567 by George I., youngest son of Philip the Generous. The war of succession with Hesse-Cassel which broke out under the reign of his successor, Louis V. the Faithful, continued to rage during that of his son George II. (1626-'61), but was brought to a close in 1647 by the cession of Marburg and other contested localities in exchange for Giessen and other territory. During the French revolution much territory was lost, which was more than regained by the treaty of Lunéville in 1801. Louis X. (born 1753, died 1830), joined the confederation of the Rhine, adopting as grand duke the name of Louis I., obtained from Napoleon still further accessions of territory, caused his troops to act against Austria in 1809 and in concert with the French in 1813, but joined the allies after the battle of Leipsic, on condition of being left in possession of his newly acquired territory. In 1815 he joined the German confederation, and made large cessions on the right bank of the Rhine to Prussia and other states, but obtained valuable possessions on the left bank of that river, including Mentz and Bingen. In 1828 the grand duke joined the Prussian customs union, by which he gave the first impulse to the formation of a more general union, which culminated eventually in the *Zollverein*. Soon after the death of Louis I., and the accession of Louis II., riots were produced by the French revolution of 1830, which were quelled by the army. The revolution of 1848 extorted from the grand duke the concession of the trial by jury. He appointed his son as co-regent, March 5, 1848. He died June 16, and his son, the present grand duke Louis III., succeeded.

HESSÉ-HOMBURG, a German landgraviate, consisting of the province of Homburg, which is surrounded by the territory of Nassau, Hesse-Darmstadt, Hesse-Cassel, and Frankfurt, and of the more populous province of Meissenheim, which lies between Rhenish Prussia, the Bavarian Palatinate, and the Oldenburg principality of Birkenfeld; total area, 106 sq. m.; pop. in 1859, about 25,000, of whom 3,000 are Roman Catholics, about 200 Jews, and the rest Protestants. The country produces grain, cattle, and timber in abundance, also iron and coal in Meissenheim. The woollen, linen, and other goods manufactured there are chiefly destined for the Frankfurt market. The landgrave (since 1848, Ferdinand) owns extensive estates in various parts of Germany. The public debt is

\$500,000. The expenditures in 1858 were \$200,000, \$25,000 more than the receipts. A large amount is annually received from the gambling tables at the watering place of Homburg, the capital. The attempts made by the Frankfort parliament in 1849 to close them by force of arms were set at naught as soon as the troops had left, and gambling has since been resumed with great spirit. Hesse-Homburg has one vote in the full council of the German confederation, to which it contributes a contingent of 333 men. It belonged formerly to Hesse-Darmstadt, and became an independent territory in 1596, when it was allotted to Frederic I. by his father George I. In 1815 Meissenheim was added to its territory. In 1830 disturbances broke out consequent upon the French revolution. In 1835 the landgrave joined the *Zollverein*. A liberal constitution was promulgated after the revolution of 1848, but withdrawn in 1852. The present landgrave, Ferdinand, is childless, and after his death Hesse-Homburg will again revert to Hesse-Darmstadt.

HESSIAN FLY, a small gnat or midge, of the order *diptera*, family *cecidomyiadae* or gall gnats, and genus *cecidomyia* (Latr.). It was called Hessian fly from the supposition that it was brought to this country in some straw by the Hessian troops during the revolutionary war; it was first scientifically described in 1817 by Mr. Say as *cecidomyia destructor*. The body of the insect is about $\frac{1}{10}$ of an inch in length, and the expanse of wings $\frac{1}{4}$ of an inch or more; the head, antennae, thorax, and feet are black; the hind body is tawny, marked with black on each ring, and with fine grayish hairs; the wings are blackish, tawny at the narrow base, fringed with short hairs, and rounded at the tip; the legs pale red or brownish; the egg tube of the female rose-colored. The antennae are long, with bead-like swellings most distinct in the male, surrounded by whorls of short hairs, with 15 to 18 joints, globular in the male, oblong oval in the female; the proboscis is short, without piercing bristles; eyes kidney-shaped; legs long and slender, with the first joint of the feet short; and the wings with few veins. This insect, so destructive in some seasons in the fields of wheat, barley, and rye, generally matures 2 broods in the course of a year, appearing in spring and autumn, earliest in the southern states; the transformations of some are retarded in various ways, so that their life from the egg to the perfect insect may be a year or more, rendering the continuance of the species in after years more sure. The eggs, about $\frac{1}{30}$ of an inch long, translucent, and pale red, are placed in the longitudinal creases of the leaves of both winter and spring wheat very soon after the plants are above the ground, to the number of 20, 30, or more on a leaf; if the weather be warm, they are hatched in 4 or 5 days, and the larvae, small footless maggots, tapering at each end, and of a pale red color, crawl down the leaf and fix themselves between it and the main stalk, just below the surface of

the ground, there remaining head downward till their transformations are completed, nourished by the juices of the plant, which they obtain by suction. Two or three larvae thus placed will cause the plant to wither and die. In about 6 weeks they attain their full size, $\frac{3}{8}$ of an inch in length, when the skin gradually hardens and becomes of a bright chestnut color, about the 1st of December in the autumn brood, and in June or July in the spring brood. In the beginning of this, the pupa state, they look like flax seed; in 2 or 3 weeks the insect within becomes detached from the leathery skin, and lies loosely in it, a motionless grub; within this it gradually advances toward the winged state about the end of April or beginning of May, according to the warmth of the weather. When mature, it breaks through this case, enveloped in a delicate skin, which soon splits on the back, setting the perfect insect at liberty. Many of those laid by the spring brood are left in the stubble, and remain unchanged until the following spring; some, however, do not get so low on the stalk as to be out of the way of the sickle, and thus with the straw may be transported long distances, and might have been brought in the flax-seed state across the Atlantic from Europe. The perfect insects, though small, are active and able to fly considerable distances in search of fields of grain. The insect supposed to be the Hessian fly, which Miss Morris found laying its eggs in the seeds of wheat instead of on the leaves, she afterward ascertained to be another species, which she called *C. culmicola*. This destructive insect was not known to exist in America before the revolution, and was first observed in 1776 on Staten island, near the place of debarkation of the Hessian troops under the command of Sir William Howe; thence it spread to Long island, southern New York, and Connecticut, proceeding inland at the rate of about 20 miles a year; it was seen at Saratoga, 200 miles from Staten island, in 1789, and west of the Alleghanies in 1797; so great was the destruction, that the cultivation of wheat was abandoned in many places. Burning the stubble in wheat, rye, and barley fields, afterward ploughing and harrowing the land, appears to be the best method of getting rid of this insect; steeping the grain, rolling it in plaster or lime, or other methods of securing a rapid and vigorous growth, sowing the fields with wood ashes and feeding off the crop by cattle in the autumn, are useful accessory means. Various minute parasitic insects, of the hymenopterous order, similar in their habits to the ichneumon flies, destroy a very large proportion of every generation of the Hessian fly, preying upon their eggs, larvae, and pupae. The insect which commits such depredations on the wheat crops of Great Britain, *C. tritici* (Kirby), will be described under WHEAT FLY. For details on the history, habits, and transformations of the Hessian fly, the reader is referred to the work of Dr. Harris on "Insects Injurious to Vegetation," and to the numerous authorities cited by him.

HETMAN. See ATTAMAN.

HETTNER, HERMANN JULIUS THEODOR, a German archaeologist, born in Leysersdorf, Silesia, in 1821. He studied at Berlin, Heidelberg, Halle, and Breslau, spent 3 years in Italy in the examination of works of art, and became in 1851 professor of æsthetics and of the history of literature and art at Jena. In 1852 he accompanied Götting and Preller on their journey to Greece, published in 1853 *Griechische Reise-Skizzen*, and has officiated since 1855 at Dresden as director of the royal museum of antiquities, as professor of art history, and member of the senate of the academy of fine arts.

HEUSDE, PHILIPPUS WILHELMUS, a Dutch philosopher, born in Rotterdam, June 17, 1778, died in Geneva, July 28, 1839. He studied philosophy and law at Amsterdam under Cras and Wytténbach, following the latter in 1799 to Leyden. He was appointed professor of eloquence and history in the university of Utrecht, and by his reputation and labors raised that institution to a higher position than it ever before occupied.

HEVELIUS (HEVEL, or HEWELCKE), JOHANN, a Polish astronomer, born in Dantzic, Jan. 28, 1611, died there, Jan. 28, 1688. He was of noble birth, studied at Leyden, and from 1630 to 1634 travelled in Europe. Returning to Dantzic, he applied himself to drawing and mechanics with a view of improving optical instruments, established in his house a private press from which most of his works were issued, and was chosen councillor in 1651. In 1641 he constructed an observatory, called Stellæburgum, which he provided with instruments chiefly of his own manufacture, that had been surpassed in excellence only by those of Tycho Brahe. In 1679 he was visited by Halley, whom the royal society of London had requested to examine his observations. In that year his observatory was burned down, with his library and many of his manuscripts. He soon rebuilt it, and continued his astronomical pursuits till his death. As an observer he ranked next to Flamsteed among the astronomers of his age. Among his works are: *Selenographia* (1647); *Cometographia* (1668); *Machina Cælestis* (1673-9); *Firmamentum Sobiescianum* (1690); and *Prodromus Astronomicæ* (1691).

HEWES, JOSEPH, an American patriot, one of the signers of the declaration of independence, born in Kingston, N. J., in 1730, died in Philadelphia, Nov. 10, 1779. He was educated at Princeton college, and then went to Philadelphia to engage in mercantile business. About 1760 he removed to North Carolina, and settled in Edenton. He soon became a member of the colonial legislature, and in 1774 was sent as a delegate to the general congress at Philadelphia. Soon after taking his seat he was appointed on a committee to "state the rights of the colonies in general, the several instances in which those rights are violated or infringed, and the means most proper to be pursued for obtaining a restoration of them," and

aided in the preparation of its report. The congress adjourned in October, and a new one met in the succeeding May, of which Mr. Hewes was again chosen a member, and served with distinction on many of the most important committees during 1775-6. In 1777 he declined a reelection, but resumed his seat in July, 1779.

HEWITT (STEBBINS), MARY ELIZABETH, an American authoress, born in Malden, Mass. Her maiden name was Moore, and she was the daughter of a New England farmer, who died when she was but 3 years old. Her mother then removed with her to Boston, where she remained till soon after her marriage with Mr. James L. Hewitt, when she took up her residence in New York. She is chiefly known by her poetry, which has appeared in different periodicals, and in a collection from these entitled "Songs of our Land" (Boston, 1845). In 1850 she edited the "Gem of the Western World," and the "Memorial," the latter a tribute to her friend Mrs. Frances S. Osgood. Her last work is "The Heroines of History" (1856). In 1854 she was married to Mr. R. Stebbins.

HEXAMETER (Gr. ἑξ, six, and μέτρον, measure), the heroic verse of the Greeks and Romans, consisting of 6 feet, the last of which must be a spondee, the last but one a dactyl, and the first 4 dactyls and spondees indifferently. The 5th foot is sometimes a spondee, when the verse is termed spondaic. The cæsural pause occurs near the middle of each verse. The hexameter has been successfully attempted in German, as in the *Hermann und Dorothea* of Goethe; and Southey, Lockhart, and Longfellow have employed it in English.

HEYDEN, FRIEDRICH AUGUST VON, a German novelist and poet, born near Heilsberg, East Prussia, Sept. 3, 1789, died in Breslau, Nov. 5, 1851. He was educated at the gymnasium and university of Königsberg with a view to state service, but his tastes inclined him to languages, art, and literature; and having determined to devote himself to them, he went first to Berlin, where he attended the lectures of Niebuhr, Wolf, and Fichte, and then to Göttingen. There he made rapid progress, chiefly through his intimacy in the circle of literature which gathered around the intelligent Dorothea von Rodde, Schlözer's daughter. In 1813 political excitement induced him to enter the army, with which he was in active service until 1815. After the peace he obtained civil employment, married the niece of the author Hippel, and was advanced to the rank of Prussian state councillor. Previous to 1815 he had published his drama *Renata*, after which he wrote the tragedy *Konradin*, his "Dramatic Novels," poetical works, and several plays. He formed the plan of writing a series of grand historical poems, which should reproduce the romantic and heroic ages not only of Europe but of India, and the first part of this appeared in *Reginald*, a work of great merit. He also wrote a great number of small tales and novels, which are less esteemed.

HEYDT, AUGUST VON DER, a Prussian statesman, born in Elberfeld, Feb. 15, 1801. At an early age he visited France and England with a view of familiarizing himself with industrial and commercial affairs. After his return to his native city, he became a member of the banking establishment of his father and of the municipal government. In 1840 he was appointed president of the tribunal of commerce, in 1841 deputy to the diet of the Rhenish provinces, and in 1847 to the general diet. He declined to serve in the German parliament, but accepted, Dec. 4, 1848, the office of minister of commerce, industry, and public works. The improvement in the Prussian postal and telegraphic systems and the extension of railways and public works are mainly due to his energy. The commercial treaties with Sardinia (1850), Holland (1850), Austria (1853), Bremen (1850), and Mexico (1855), were concluded under his auspices. By a law of Feb. 5, 1855, he permitted foreign shipping to participate in the Prussian coasting trade, on condition that the same privilege should be reciprocated by other countries; and the navigation school of Dantzic has been reorganized and a new school of navigation established in Stettin through his influence. He remodelled the system of industrial instruction, which now comprises the ordinary and the provincial industrial schools and the great industrial academy of Berlin, and aims at producing harmony among the various pursuits of mechanics by the reestablishment of guilds, without interfering, however, with individual enterprise. Mining has greatly advanced under his administration; the production of coal has risen from 23,000,000 tons in 1851 to 34,000,000 in 1855, and the number of forges from 173 in 1852 to 223 in 1855. Joint stock manufacturing companies have received his special patronage, numbering 54 in 1854, with a capital of \$40,000,000; and the manufacturing interest of Prussia generally has flourished since his advent to the ministry. Since 1851 he has presided over the bank of Prussia, and contributed much to raise the national importance and the credit of that institution.

HEYLIN, PETER, an English theologian, born in Burford, Oxfordshire, in 1600, died in London, May 8, 1662. He was educated at Oxford, read lectures on history and geography, was made D.D., and in 1629 was nominated, at the request of Land, one of the chaplains in ordinary to the king. He was a zealous royalist, and in the time of the rebellion his property was confiscated by the parliament, and he himself was obliged to fly to Oxford, where he edited the journal called *Mercurius Aulicus* till 1645. On the restoration he was appointed sub-dean of Westminster by Charles II. His writings comprise about 37 works, chiefly on church history and polemics.

HEYNE, CHRISTIAN GOTTLIEB, a German philologist, born in Chemnitz, Saxony, Sept. 25, 1729, died in Göttingen, July 14, 1812. He studied philology and the classics at Leipsic, and

afterward obtained at Dresden a situation as under secretary in the library of the minister there, with a salary of 400 francs a year. In the library of Dresden he became intimate with Winckelmann, then a young, poor student like himself. In 1763 he was appointed to fill the chair of eloquence and poetry in the university of Göttingen, and he remained connected with that institution till his death. He published his views on the manner of studying the ancient authors in his edition of the *Apollodori Bibliotheca* (Göttingen, 1782), and in several essays, which appeared in the "Transactions of the University of Göttingen." He was made chief librarian of the library of Göttingen, perpetual secretary of the royal society, and foreign member of the institute of France. He published editions of Tibullus (Leipsic, 1753), Epictetus (1756), Virgil (1767), Pindar (Göttingen, 1774), Homer (Leipsic, 1802), Diodorus Siculus, and other classic authors. His life has been written by his son-in-law, Heeren.

HEYWOOD, JONAS, an English humorist, born probably at North Mims, near St. Albans, in the early part of the 16th century, died in Mechlin in 1565. He was educated at Oxford, and became a favorite of Henry VIII. and subsequently of Queen Mary, whom he amused by his wit and musical talents. He is the author of a number of "interludes" of a humorous character, the best known of which, perhaps, is "The Four P's," and of a tedious burlesque allegory called "The Spider and the Fly." He also published "Six Centuries of Epigrams," from which he has been called the epigrammatist. On the accession of Queen Elizabeth he was obliged to leave England.—THOMAS, an English dramatist, born in Lincolnshire in the latter half of the 16th century, died about 1650. He was educated at Cambridge, and was an actor as well as a writer. In voluminousness he probably exceeds any other English author, having written either the whole or the greater part of 220 plays, of which but 23 survive. Some of them, such as "A Woman Killed with Kindness" and "The Four London Prentices," are not inferior to the productions of Massinger, Ford, and others of his contemporaries. Charles Lamb calls him "a sort of prose Shakespeare."

HEZEKIAH, king of Judah, succeeded his father Ahaz about 728 B. C., when he was 25 years old, died about 699. Following the injunctions of the prophet Isaiah, immediately on his accession he took measures to break up the idolatrous customs into which the people had fallen during the life of his father, and to repair the losses and defeats they had suffered. Early in his reign the Assyrians invaded the neighboring kingdom of Israel, and carried away captive the 10 tribes to distant provinces beyond the Tigris; but notwithstanding the power and threats of the conquerors, Hezekiah refused to acknowledge subjection to Assyria, or to pay the tribute which had been imposed and paid during the reign of his father. In consequence of this, the Assyrian king Sennacherib invaded

his kingdom in the 14th year of his reign; but after various exploits his army met with a sudden destruction, and the survivors precipitately retreated. Soon after this signal deliverance, Hezekiah was seized with a severe illness, the fatal termination of which was averted in answer to his prayers, and 15 years were added to his life, the latter part of which was passed in tranquillity and peace.

HIACOOMES, the first Indian convert to Christianity in New England, born about 1610, died in Martha's Vineyard about 1690. Under the preaching of the missionary Thomas Mayhew he was converted to Christianity, and having been taught to read, he began in 1653 to preach to his brethren in Martha's Vineyard. He succeeded in making a number of converts among them, notwithstanding the menaces directed against him by the Indian priests. In Aug. 1670, an Indian church was formed at Martha's Vineyard, and Hiacoomes became its pastor.

HIBBARD, FREEBORN GARRETSON, an American clergyman, born in New Rochelle, Westchester co., N. Y., Feb. 22, 1811. At the age of 18 he entered the ministry of the Methodist Episcopal church, before he had finished his collegiate course. He has been appointed to several important stations in the church, and frequently elected to the general conference, at the last of which he was chosen editor of the "Northern Christian Advocate," which post he now (1860) occupies. He has devoted himself especially to biblical and theological literature. His principal works are: "Baptism, its Import, Mode, Efficacy, and Relative Order;" "Geography and History of Palestine;" and "The Psalms, chronologically arranged, with Historical Introductions, and a General Introduction to the whole Book."

HIBERNATION (Lat. *hibernare*, to go into winter quarters), generally understood as the condition of lethargy in which many animals pass the cold season. The sources of their daily food being at this time cut off, they sink into a deep sleep, in which nutriment is unnecessary, and so remain until the warm weather of spring; a beautiful provision of the Creator for the preservation of animals which would otherwise perish from cold and hunger. Among the animals in which this state has been noticed are the bat, hedgehog, dormouse, hamster, marmot, and other rodents; chelonians, saurians, ophidians, and batrachians, among reptiles; and some fishes (like the eel), mollusks, and insects. The phenomena of hibernation, however, are not confined to the winter season, and are not necessarily connected with a low degree of external temperature; the bats, in the summer time, present these phenomena regularly every 24 hours; the tenrec, a nocturnal insectivorous mammal, though living in the torrid zone, according to Cuvier passes three of the hottest months of the year in a state of lethargy. The influence of cold in producing this state is due only to its tendency to cause sleep, and if carried too far, instead of inducing the physiolo-

gical condition of hibernation, leads to the pathological one of torpor, and even death. According to Marshall Hall ("Cyclopædia of Anatomy and Physiology," article "Hibernation"), the quantity of respiration is inversely as the degree of irritability of the muscular fibre, the former being measured by the amount of oxygen inspired, and the latter by that of the galvanic force necessary to demonstrate its existence. Birds have a high respiration and a low muscular irritability; reptiles, on the contrary, have a high degree of irritability and a low respiration. This is true also of the progressive development of animals from the immature to the perfect state, in which the change is from a lower to a higher respiration, and from a higher to a lower muscular irritability. In sleep, and especially in the profound sleep of hibernation, the respiration is diminished and the irritability increased. To whatever the susceptibility to this change be owing, the capability of passing into a state of hibernation depends, according to this author, on the power of taking on an increased muscular irritability; certain animals pass beyond the physiological limits of ordinary sleep into the lethargy of hibernation, the mammal for the time assuming in this respect reptilian characters. Were the respiration to be diminished without the increased irritability, death would take place from the torpor of slow asphyxia; and were the respiration increased without the diminution of the irritability, the animal would die from over stimulation, as in those suddenly aroused from the state of hibernation, or as if submitted to an atmosphere of pure oxygen. Sleep and hibernation are similar periodical phenomena, differing only in degree, and the latter is extraordinary only because less familiar than the former; the ordinary sleep of the hedgehog and dormouse, and of the bat in summer, is a diurnal hibernation, ceasing daily at the call of hunger, and accompanied by a diminution of respiration and animal heat; and this sleep may pass into true hibernation, as the blood becomes more venous in the brain, and the muscular fibres of the heart acquire increased irritability. In perfect hibernation the process of sanguification is nearly or entirely arrested; the bat takes no food, and passes no excretions from the intestines or kidneys; but the dormouse awakes daily, and the hedgehog every 2 or 3 days, in a temperature of 40° to 45° F., take food and pass excretions, and subside again into their lethargy. Respiration is also very nearly or entirely suspended in perfect hibernation, as has been experimentally proved by the absence of all external respiratory acts, by the unchanged condition of the surrounding air, by the diminution of the animal heat to that of the atmosphere, and by the capability of supporting the entire privation of air or the action of carbonic acid and other irrespirable gases. The circulation, though very slow, is continuous, and the heart beats regularly; the blood, from the absence of respiration, is en-

tirely venous, but the increased muscular irritability of the left ventricle of the heart permits it to contract under the slight and usually insufficient stimulus of a non-oxygenated blood; it is the exaltation of this single vital property which preserves life and renders hibernation possible, forming the only exception to the general rule of the circulation in animals which possess a double heart; the slow circulation of a venous blood keeps up a state of lethargy induced by a diminished respiration. Sensation and volition are quiescent as the brain and its sensory ganglia are asleep, but the true spinal or excito-motory system is awake and its energies are unimpaired, as is shown by the facility with which respiration is excited by touching or irritating the animal; muscular motility is also unimpaired in this state; the action of the heart has been found to continue about 10 hours in an animal in the state of hibernation, in which the brain had been removed and the spinal marrow destroyed, while in the same animal in a natural state it ceases after 2 hours. With such an irritable condition of the heart, the introduction into it of an arterial or oxygenated blood from respiration would soon cause death from over stimulation; and as trifling causes are sufficient to excite the respiratory act, hibernating animals adopt various means of securing themselves from disturbance; bats retire to the recesses of gloomy caverns, where they hang suspended by the claws of the hind feet, head downward; the hedgehog and the dormouse roll themselves into a ball; tortoises burrow in the earth, frogs and eels plunge under the mud, and snakes twist themselves together in natural or artificial crevices and holes in the ground. The call of hunger and the warmth of returning spring arouse all these from their winter retreats, the irritability gradually diminishing as the respiration becomes active. Extreme cold will rouse a hibernating animal from its lethargy, and speedily kill it; hence many animals congregate in carefully prepared nests, and others, like the snakes, entwine themselves for mutual protection from cold. The state of hibernation, or that in which the stimulus of venous blood is sufficient to continue the heart's action, finds a parallel in some cases of disease accompanied by lethargy, in which revival has occurred after supposed suspended animation, and in others in which actual death has been delayed for days after the apparent cessation of respiration and circulation; the causes of this condition, which might throw much light on the kinds and phenomena of death, have not been fully investigated in the human subject. The torpor produced by extreme cold, though sleep be always induced, is very different from true hibernation; the former is attended with diminished sensation and rigidity of the muscles, and if prolonged ends in arrest of the circulation and death; the latter, in which sensation and motility are unimpaired, has for its object the preservation of life; the hibernating bat or dormouse is aroused

from its sleep by too great cold, and is destroyed by it like any other animal. Most animals lay up a store of fat under the skin, which is slowly absorbed during hibernation; in the frogs, and probably in other reptiles, the adipose accumulation takes place within the abdominal cavity in the folds of the peritoneum, for a similar purpose. The phenomena of insect hibernation are very interesting in all stages of growth; many pass the winter in this condition, both above and beneath the surface of the ground; eggs and chrysalids have been known to withstand a temperature several degrees below the freezing point of water. It is well known that many species of fish may become stiff from cold and yet not perish, but actual congelation is fatal; in the so called frozen fishes which have revived in warm water, there must have been a low degree of vital action in the organs of circulation. In many reptiles the necessary respiration may be effected entirely through the skin, in the hibernating state. The lower animals generally seem to possess a remarkable power of resisting cold, and may be reduced to a condition of apparent death, without the irritability of hibernation, and yet not identical with the torpidity usually produced by cold.

HIBERNIA. See IRELAND.

HICCOUGH, a spasmodic contraction of the diaphragm, producing a shock in the thoracic and abdominal cavities, and accompanied by a convulsive inspiration in which the column of air is arrested by the sudden closing of the glottis, and by a loud and well known clucking sound. Authors are not agreed as to the origin of this act, but the movement is undoubtedly of a purely reflex character; though the spasmodic action be in the diaphragm, its point of departure may be in the abdominal organs or in the nervous centres. In ordinary cases it comes and goes spontaneously, and is a matter of no consequence beyond a slight inconvenience under certain circumstances; but it may be preceded by gastric symptoms, pain, and cructations, be accompanied by labored respiration, and be so persistent and severe as to require active treatment. It is often seen in children and in adults who have eaten or drunk immoderately or hastily, after long fasting, in diseases of the stomach, intestines, and liver, and in nervous persons troubled with flatulence; it becomes an important diagnostic sign in peritonitis, strangulated hernia, and other intestinal obstructions; it is not uncommon in intermittent fevers, and is a grave symptom in typhoid and gangrenous affections accompanied by other spasmodic phenomena. In nervous persons it may be brought on by any excitement, and generally disappears with its cause; if not, a few swallows of cold or acidulated water, cold sprinkling, or vivid emotion of any kind, will put an end to it in a few moments; obstinate cases are on record, which required cold shower baths, ice externally and internally, narcotics, and revulsives to the epigastrium; when inter-

mittent, it yields to quinine; if symptomatic, the nature of the disease will indicate its treatment.

HICKMAN. I. A central co. of Tenn., drained by Duck and Piney rivers; area, 550 sq. m.; pop. in 1850, 9,397, of whom 1,816 were slaves. The surface is uneven, and the soil rich and well watered. Iron ore is abundant. The productions in 1850 were 635,265 bushels of Indian corn, 82,250 of oats, 29,396 of sweet potatoes, 34,146 lbs. of tobacco, 92,016 of butter, and 17,202 of wool. There were 20 churches, and 30 pupils attending an academy. Capital, Centreville. II. A S. W. co. of Ky., bordering on Tenn., separated from Mo. by the Mississippi river, and drained by the bayou de Chien and other small streams; area, 220 sq. m.; pop. in 1850, 4,791, of whom 840 were slaves. The surface is gently undulating, and the soil consists of rich mould with a substratum of sand. The productions in 1850 were 317,671 bushels of Indian corn, 31,896 of oats, 378,580 lbs. of tobacco, and 6,339 of wool. There were 2 grist mills, 4 saw mills, 17 churches, and 410 pupils attending public schools. Value of land in 1857, \$910,669. The Mobile and Ohio railroad passes through Clinton, the capital.

HICKOK, LAURENS PERSETS, D.D., an American metaphysician, born in Danbury, Conn., Dec. 29, 1798. He was graduated at Union college in 1820, devoted himself to theology, was licensed as a preacher in 1822, and was pastor successively at Newtown and Litchfield, till in 1836 he was elected professor of theology in the Western Reserve college, O., where he remained 8 years. In 1844 he became professor in the Auburn theological seminary, and in 1852 removed to Schenectady, N. Y., where he was appointed to the professorship of mental and moral science, together with the office of vice-president, in Union college. His publications, beside various occasional sermons and addresses, and contributions to the "Christian Spectator," "Biblical Repository," and "Bibliotheca Sacra," are: "Rational Psychology" (8vo., Auburn, 1848); "Moral Science" (Schenectady, 1853), treating of our duties to God, and mankind under the head of pure morality, and of civil, divine, and family government under that of positive authority; "Empirical Psychology, or the Human Mind as Given in Consciousness" (1854); and "Rational Cosmology" (New York, 1858), in which he attempts to demonstrate *a priori* the laws of the universe.

HICKORY (*carya*, Nuttall), the common name of several species of timber trees, with large compound leaves, having from 5 to 15, but usually not more than 11 leaflets. The hickories belong to the natural order of *juglandaceæ*, an order consisting chiefly of these and of the walnuts, valuable for their wood and some of them for their fruits. The flowers of the hickory are of 2 kinds: sterile, which are borne in compound catkins, each principal catkin having 2 oppo-

site branches, the stamens from 4 to 8 in each flower; and fertile, which are solitary or else in small groups at the ends of the branches. The fruit is a large roundish nut, the husk of which opens partially or wholly of itself by 4 seams. The genus *carya* is exclusively American; the nearest approach to it among foreign trees is the Asiatic walnut (*juglans regia*, Linn.). There are many species, all of them remarkable for stateliness and general beauty. In the autumnal scenery, the foliage of the hickories contributes a pleasing share, each species possessing its own peculiar hues and tints. As an ornamental tree the hickory can be recommended for planting. If raised from the nut and subjected to nursery treatment, the young trees could probably be transplanted without difficulty; but the hickory seldom survives when taken from the woods, as its roots are large, few in number, and easily killed. The bitter-nut hickory (*C. amara*, Nutt.) is the most graceful and remarkable for its finely cut foliage. It raises a noble columnar top to the height of 60 or 70 feet, enlarging upward, and broadest at 40 or 50. Its recent shoots are of an orange green, smooth and dotted with orange. Its fruit, however, is intensely bitter. It has an abundance of fibrous roots, so that if the young trees were transplanted they could be used for stocks on which to engraft other kinds. The pig-nut hickory (*C. glabra*, Torrey) is also a large tree, with a close bark and very tough and valuable wood; its sprouts are used as withes; the wood when mature is much preferred for making axles of wagons. Its fruit is variable in size and form, and is abundant, but of a disagreeable taste. The small-fruited hickory (*C. microcarpa*, Nutt.) grows in the moist woodlands of Pennsylvania and southward, and its trunk rises to the height of 60 to 80 feet; its fruit is small, but eatable. The mocker-nut hickory (*C. tomentosa*, Nutt.) is a fine stately tree, with an erect trunk, forming at the summit a graceful pyramidal head of a few moderate sized branches. It is sometimes called white-heart hickory, although the wood in the old trees does not differ in color from that of the other kinds. Its sap is of sirup-like sweetness, and is very abundant in early summer. There are several varieties of the species, of which the most remarkable is the *C. l. maxima* (Nutt.), bearing fruit as large as an apple, with a very thick husk. Michaux asserts that it is slow of growth, and that the wood is liable to the attacks of worms, and is the least worthy of cultivation. The mocker-nut hickory has a wide distribution, being found in New England as well as in the middle states. The shell-bark or shag-bark hickory (*C. alba*, Nutt.) is easily distinguishable by its shaggy bark, its excellent fruit, and its ovate, half-covered leaf buds. The shag-bark is a stately tree, rising to about 60 to 80 feet. Its branches are irregular and scattered; but when growing singly in open space, the tree attains much beauty and gracefulness. The delicious flavor of its fruit is not surpassed by any foreign

nut. Large quantities of the nuts, brought from districts where the species grows best, are readily disposed of in the markets; and the logs and larger branches are among the best materials for fuel. In the woods of Pennsylvania and westward to Illinois and Kentucky, the thick-shelled hickory (*C. sulcata*, Nutt.) is found, having nuts nearly as sweet as those of the shagbark. The pecan hickory (*C. oliviformis*, Nutt.) is a more western and southern species, extending in its natural growth from Illinois to Louisiana. The tree is of slender growth, and the qualities of its fruit are well known. The nutmeg-fruited hickory (*C. myristiciformis*, Nutt.) was first described by Michaux from a branch and some nuts given him at Charleston, S. C. The fruit is described as very small, smooth, and brown, streaked with white, and strongly resembling a nutmeg; the kernel is of little size or value. Elliott says that he was unable to meet with it in his researches, although he made many attempts; the specimen in question was perhaps a mere garden variety. Other species are mentioned, but on no authentic information.

HICKORY, a S. W. co. of Mo., intersected by the Pomme de Terre river, a tributary of the Osage; area, 408 sq. m.; pop. in 1856, 3,312, of whom 206 were slaves. It has a moderately uneven surface, covered in some places by a good growth of timber, and a rich soil. The productions in 1850 were 79,212 bushels of Indian corn, 4,278 of wheat, 28,212 of oats, 6,048 lbs. of wool, and 542 tons of hay. There were 2 saw mills, 1 grist mill, 4 churches, and 186 pupils in public schools. Capital, Hermitage.

HICKS, ELIAS, an American preacher of the society of Friends, born in Hempstead, L. I., March 19, 1748, died in Jericho, L. I., Feb. 27, 1830. While a youth he manifested a talent for public speaking, and at the age of 27 was a well known preacher. For many years he labored zealously in advancing the generally accepted doctrines of the Friends; but having as he believed discovered errors in these tenets, he put forth views of his own which he defended with energy and ability. To advance these views he travelled extensively in the United States and in the British provinces, attracting large congregations by his oratory. The result was a schism in the body of Friends; those adhering to the old doctrines being specially termed orthodox, while the followers of Hicks were called after him Hicksites. (See FRIENDS.) He preserved his intellectual vigor till late in life, visiting when 80 years of age New Jersey, Pennsylvania, Maryland, Ohio, Indiana, and the northern and western parts of New York. His theological writings were principally in an epistolary form.—See "Elias Hicks, Journal of his Life and Labors" (Philadelphia, 1828), and his "Sermons" (1828).

HICKS, THOMAS, an American painter, born in Newtown, Bucks co., Penn., Oct. 18, 1823. He is a descendant of the preceding, and was educated in conformity with the principles of the society of Friends. He attempted portrait

painting in his 15th year, and in 1838, after copying the casts in the Pennsylvania academy of fine arts, entered the life and antique schools of the national academy of design in New York, to whose annual exhibition in 1841 he contributed a picture of the "Death of Abel." For several years he painted portraits and compositions, and in 1845 departed for Europe, where he remained during the next 4 years. Establishing himself in Rome in the autumn of 1845, he painted, among other works, a half-length figure called "Italia," for Mr. William H. Appleton of New York. In the succeeding spring, on the last night of the carnival, he was stabbed in the back with a stiletto while crossing the Piazza Colonna in a dense crowd, and lay for many weeks in a critical condition. After a protracted residence in Italy, during which he executed many cabinet pictures, portraits, and copies of the old masters, he repaired in June, 1848, to Paris, and after the revolutionary outbreak of that month harbored two insurgents in his studio, and assisted them to escape from France. He studied under Couture in Paris, where he remained about a year, and after a brief residence in England returned to New York, of which city he is now a resident. He has since devoted himself principally to portrait painting, but has occasionally produced landscapes and figure pieces. His last prominent portrait is that of Dr. Kane in the cabin of the Advance, and he is now engaged upon a large picture of the contemporaneous authors of America, in which the figures are of life size.

HIDALGO, a S. co. of Texas, separated from Mexico by the Rio Grande, and drained by Palo Blanco and other small streams; area, 2,300 sq. m.; pop. not given in the latest state returns. It has a level surface, covered in many places with mezquite and chapparal, and a productive soil. It was formed from part of Cameron co. in 1852. Capital, Edinburg.

HIDALGO, a word applied in Spain to every noble man or woman, but strictly the title of the lowest order of nobility, constituting the *hidalgua*. Some writers derive the word from *hijo del Goto*, the son of a Goth, such descent being held in Spain to imply greater purity of blood than when intermixed; others from *hijo de alguno*, son of somebody. Hidalgos are divided into *hidalgos de naturaleza*, deriving their privileges from their ancestors, and *hidalgos de privilegio*, who have purchased their rank, or obtained it by court favor instead of descent, and are in this respect on an equality with simple *caballeros* and *escuderos*, or knights and squires. A *hidalgo de bragueta* was one supposed to possess the privileges of nobility from being the father of 7 sons without an intervening female child; and a *hidalgo de gotero* was one who enjoyed the rights of nobility in one place alone. The privileges of the hidalgos were abolished by the introduction of the constitutional system. In Portugal the word *fidalgua* embraces all the nobility under the common denomination of *fidalgos*.

HIDALGO Y COSTILLA, DON MIGUEL, the first leader in the Mexican war of independence, born in South America in the latter part of the 18th century, shot at Chihuahua, Mexico, July 27, 1811. He was a priest, and in earlier life was simply a man of great acquirements, who was anxious to promote industry in Mexico, and who was noted for the conscientious fulfilment of his ecclesiastical functions. He is said to have introduced the silkworm into Mexico, and did much to promote the culture of the vine. This conflicted with the policy of the Spanish government, which was to discourage all manufactures or agriculture which could interfere with the revenue, and the vines which Hidalgo had planted were destroyed. This drove him to rebellion. Possessing much influence among the Indians, he formed the plan of a general insurrection, which was to take place Nov. 1, 1810; but the plot having been disclosed by one of the conspirators, some of his party were arrested, and he was obliged to precipitate his movements. On Sept. 10, having been joined by 3 officers of the garrison of Guanajuato, he raised the standard of revolt. His eloquence had a remarkable effect on the multitude who heard him, and when after his oration he unfurled a rude copy of the picture of Our Lady of Guadalupe, the patroness of Mexico, the war assumed the character of a crusade. On Sept. 29, with an army of 20,000 men, mostly Indians, he captured Guanajuato, on which occasion the greatest outrages were committed, and \$5,000,000 plundered. He took Valladolid and several small places, and soon after was proclaimed generalissimo of the Mexican army, and advanced against Mexico; but finding himself almost without ammunition, he was obliged to retreat. During this war the government party declared that the ordinary rules of warfare need not be observed as regarded the insurgents, while the latter retaliated with the most horrible atrocities. On one occasion Hidalgo is said to have massacred 700 prisoners because they were Europeans. After several defeats the insurgents were left at Saltillo under charge of Rayon, while Hidalgo and others went to the United States to obtain arms and military aid. On the way they were captured by a former friend, and finally shot in Chihuahua. They died bravely, Hidalgo persisting to the last in his conviction that "the knell of the Spanish rule had been sounded; that though the viceroy might resist, the end would come." He was after his death regarded as a saint by the people, and within a few years the place of his execution was shown to travellers as a holy spot.

HIDES, in commerce, the skins of some of the larger animals, which are especially adapted for the manufacture of leather, and which are also a source of glue. The term is applied chiefly to those of cattle, the horse, and the hippopotamus, and of the buffalo when intended for tanning. The skins of young cattle are distinguished as kips, and those of the deer, sheep, goat, seal, &c., even though intended for leather, are called

skins. Ox hides, which may be considered as including all the skins of the bovine kind designed for leather, and horse hides also, are articles of large export from South American countries. California also has furnished great quantities of them. The animals from which they are principally obtained roam in vast herds over the extensive llanos and pampas, the property of the estates upon which they may be found. They are lassoed and slaughtered only for the hides, and these are immediately dried in the sun and salted for exportation. Those obtained in the tropics do not make so good leather as the hides of temperate latitudes. The hides of wild horses are said to be of better quality than those of the worn-out domestic animals. The East Indies also supply a large portion of the hides of commerce, especially to the English market. They are also obtained from the West Indies, the Cape of Good Hope, from Holland, and the countries up the Mediterranean. The skins of domestic animals add to the supplies, and, under the name of green hides, are rated as of higher value than the dry or salted foreign hides; yet the latter, weight for weight, will produce much more leather, on account of the water contained in the former, which, however, require less labor in their treatment. The heaviest hides, and those which make the best sole leather, are the skins of the largest oxen. Those of the bull are thickest about the neck and parts of the belly, but in the back they are inferior in thickness and in fineness of grain to the hides of oxen, or even of cows and heifers. But hides differ much in quality even when obtained from animals resembling each other in size and in other respects, and their relative excellence cannot always be determined on examination. The best are made into the heavy leather used for the best trunks, soles of shoes, belts for machinery, harness, and other purposes. The lighter qualities serve for the uppers of common boots and shoes, and some are employed in European countries without tanning for covering trunks. Kips and the skins of calves make the best leather for the uppers of fine boots and shoes. Horse hides are inferior in thickness and strength, and only the best will serve even for uppers. They are split or shaved for the thin enamelled leather used for ladies' shoes, and are made into the white material called lace leather, which is used for thongs, for lacing belts, and various other purposes. The hides of mules and asses are tanned to make the leather called shagreen, which is used for scabbards, and formerly for cases for various instruments. The hides of the hippopotamus are exported in small numbers from southern Africa to be tanned for making the beetling implements used in washing and bleaching cotton and linen goods.—Hides were an important article of trade with the ancient Egyptians, being largely imported from foreign countries and received as tribute from the conquered tribes. In the paintings on the walls of the tombs at Thebes, skins of the leopard, fox, and other animals are seen

laid before the throne of a Pharaoh, together with gold, silver, ivory, rare woods, and various productions of vanquished countries. They exhibited great skill in their methods of curing the hides, as well as of tanning and working the leather into various useful and ornamental articles.—Hides are prepared for tanning by subjecting them to a process of cleansing to remove the particles of flesh adhering to them, and also the salt used in curing them, which in the foreign hides may average 15 lbs. for each one. The hairs are also to be removed by a subsequent process of depilation. For the cleansing they are soaked in soft water for a longer or shorter time as may be required, and the time and labor attending the operation are shortened and the risk of putrefaction avoided by the use of a swiftly running stream. The power of machinery is sometimes applied to lessen the labor of tramping and handling the hides, by which they are beaten as in the operation of felting cloth. To remove the hair different processes are in use. As practised by the ancient Egyptians, it is supposed to have been effected by the juice of some plant, probably the *periploca secamone*, which the Arabs now employ for this purpose. The skins are first left for 3 days in flour and salt, and, the fat and impurities being removed from the inner side, this is washed over with the acrid milky juice of the plant, extracted by bruising the stalks between stones, and mixed with water. This causes the hair to fall off in the course of a day. In modern times the practice has long been to soak the heavy hides for months in vats containing lime water, passing them from one to another of greater strength than the first. The hair at last can be easily removed together with the epidermis by the two-handed scraping knife rubbed over it, as the hide is laid flesh side down on the bench made for this use. The fleshy substances on the other side are then scraped off, and these are employed, like the head, cheeks, and other parts of the hide which are unsuitable for leather, in the manufacture of glue. Machines have been adopted in large establishments for facilitating the scraping operation. The lime that remains in the pores of the skin has to be removed by an operation called bating, which consists in soaking the hides in a bath of some solution containing an element, as chlorine, that will form a soluble compound with the lime. The preparations that have been in use for this purpose are generally empirical, and sometimes composed of disgusting excrementary materials, the presence of which must tend to induce putrefaction. Hydrochloric acid has been advantageously substituted, and sugar or molasses is found to be suitable from its property of forming a soluble saccharate with the lime. The acid serves also to swell or raise the texture of the hides, which is necessary to prepare them to combine with the tannin. Instead of using lime as a depilatory, weak acids are often employed with good effect. Even sour milk is found a good application, and acetic acid generated in the fer-

mentation of farinaceous meals, the hides being soaked in a succession of several vats in which this fermentation is going on. Hides are also in some parts of Europe laid in piles and allowed to begin to putrefy, great care being taken to stop the process as soon as the hair becomes ready to separate. The process is called sweating. In France they have also been subjected to the action of steam in a chamber, the temperature of which is not allowed to exceed 80°. By these processes the hides lose about $\frac{1}{3}$ of their weight. In the American plan, which is in general use in the northern states, the object is more effectually obtained with much less labor, and with no risk of injury to the leather, while the loss in weight is but $\frac{1}{4}$ to $\frac{1}{3}$. The hides are suspended in a cool vault, protected like an ice house against the entrance of warm air, and furnished with a covered channel way that answers both as a drain and a conduit for cool damp air. Cool spring water is conveyed into the vault, falling around its sides in spray. The hides are thus kept in a mist, the temperature of which is maintained at 44° to 56°; and in 6 to 12 days they are found to be freed from all extraneous matter without loss of or injury to the albumen, gelatine, and fibrine of the skin. No fermentation has taken place, but the epidermis with the roots of the hair has been distended and removed by the swelling action of the cold vapor absorbed. After the process of raising or swelling the texture, to which the hides intended for pliable leather are subjected, they are ready for the operation of tanning, by which they are converted into leather. For the further treatment of hides, see CURRYING, and LEATHER.

—The imports of hides and skins into the United States in the year ending June 30, 1858, were chiefly from Venezuela, Buenos Ayres, Brazil, and Calcutta, and were valued at \$9,884,358. The greater part came to New York and Boston. About \$1,250,000 worth were reexported, chiefly to Belgium and the Danish West Indies. American hides were exported to Canada, France, and England, to the amount of about \$900,000. The following table of the operations of the New York hide market for the year 1858 is from the trade circular of Mr. M. D. Hull, Dec. 31, 1858:

Stock of hides on hand, Jan. 1, 1858	875,000
Imports, foreign and domestic, for the year	1,902,000
City and country slaughters not appearing in imports	250,000
Total supply for the year	2,527,000
Taken for kip and upper leather purposes	250,000
“ for enamelled and patent leather	100,000
“ by western and Canadian tanners	100,000
“ by neighboring cities (sole leather hides)	150,000
Stock in hand this date	50,000
Total	650,000
Entered into consumption for sole leather purposes by the New York trade during the year	1,877,000

HIERAPOLIS (Gr., sacred city). I. A city of Phrygia, between the rivers Lycus and Mæander, celebrated for its warm springs and its cave Plutonion, from which arose a mephitic vapor which was poisonous to all but the priests of Cybele. It was the seat of a Christian church in the time of St. Paul, who mentions it in his

epistle to the Colossians (iv. 13). Its ruins, with stalactites and incrustations formed by its warm springs, are found at an unoccupied place called Bambuk-Kalessi. It was the birthplace of Epictetus the philosopher. II. A city in Syria, called Bambyce by the early natives, one of the chief seats of the worship of Astarte or Ashtoreth, and a great emporium under the Seleucidæ. Its site, first discovered by Maundrell, is marked by Turkish, Greek, and Syriac remains.

HIERO. I. A Syracusan tyrant, who succeeded his brother Gelon, 478 B. C., died in Catania in 467. After having made peace with his brother Polyzelus and Theron of Agrigentum, with whom he had been at variance, he turned his attention to foreign conquest. In Sicily he made himself master of Naxos and Catania, whose inhabitants he transferred to Leontini, while he re-peopled those cities with colonists of Dorian origin. In Italy he prevented the destruction of Locri by threatening its enemy Anaxilas with war, and subsequently effected the expulsion of the tyrant Micythus from Rhegium. But the most glorious event of his reign was his great victory over the Etruscan fleet near Cumæ, 474 B. C. He was a liberal patron of poets and philosophers. His triumphs at the Olympian and Pythian games are celebrated in the odes of Pindar. II. A Syracusan monarch, son of Hierocles, born about 307 B. C., died about 216. He was raised to the throne by the suffrages of his fellow citizens in 270. His great object appears to have been the expulsion of the Mamertines from Sicily; and when the Romans took that people under their protection, he allied himself with the Carthaginians, who had just arrived in Sicily with a mighty force. The combined armies of the Carthaginians and Syracusans then proceeded to lay siege to Messana; but Hiero, having been attacked and defeated by Appius Claudius, the Roman consul, was panic-struck, and retreated precipitately to Syracuse. Soon after this disaster, seeing his territory laid waste by the Romans, and many of his cities in their possession, he deemed it prudent to abandon the Carthaginian alliance, and concluded a treaty with the Romans by which he secured to himself the whole S. E. and E. of Sicily as far as Tauromenium. From this period till his death Hiero remained the steady friend of the Romans, and when he visited Rome was received with the highest honors.

HIEROGLYPHICS (Gr. *iepos*, sacred, and *γλυφω*, to carve), the monumental inscriptions of the ancient Egyptians (SCHI N MuT NuTeR, writing of language divine). They are also found written on a reduced scale in colors on garments, tools, and papyri. Herodotus (ii. 36) gives us the earliest information concerning them in stating that the Egyptians write from right to left, and employ two kinds of *γραμματα* or letters, namely, the holy, *ιερα*, and the popular, *δημοτικά*. Diodorus Siculus (i. 81, and iii. 3) writes that the priests teach their sons two kinds

of letters, viz., the sacred, reserved to themselves, and the *δημωδη*, which are learned by all persons. Clement of Alexandria (*Στρωματεῖς*, vi. 4) mentions three kinds of letters, viz.: *ιερατικά*, *ιερογλυφικά*, and *επιστολογραφικά*, and gives two kinds of the second: 1, the *κυριολογικά* (properly pronounced), "according to the first elements," representing the figure of the object the first sound of whose name is pronounced; 2, the *συμβολικά*, which are of three sorts: *a*, pronounced rightly by imitation, that is to say, representing the object by a symbol; *b*, tropically written; *c*, allegorized, or interpreted by enigmas. The *Hieroglyphica* of Horapollo Nilous (edited in Greek and Latin by C. de Pauw, Utrecht, 1727, and by A. T. Corey, London, 1840), written in Egyptian and translated into Greek by Philippus, a work of no great antiquity, explains 189 symbols, most of them in a doubtful manner; for instance, the number 1095 as indicative of silence. Tacitus (*Annales*, ii. 60) relates that *structis molibus litteræ Egyptiæ* were interpreted to Germanicus at Thebes by an old priest. Ammianus Marcellinus speaks of several obelisks at Rome, and gives a part of the translation of the inscription on that erected under Augustus, in the great circus, which was made by Hermapion, an Egyptian priest. He also states that the ancient Egyptians wrote letters instead of words, and sometimes instead of phrases. A few notices concerning hieroglyphics are found in Plutarch's "Isis and Osiris." Porphyry asserts that Pythagoras learned the three kinds of writing from the priests, the epistolary, hieroglyphic, and symbolic. After Young's discoveries had been matured, the symbolism of 19 hieroglyphics (derived from Chæremón's lost work on them) was found by Birch in the commentary of Tzetzes on the Iliad. The *Prodromus Coptus* (1636) of Athanasius Kircher attempted to explain every thing in a mystical, metaphysical, cabalistic way, without guessing any thing rightly, deriving the Greek from Egyptian. De Guignes senior tried to prove that the Egyptian epistolary, hieroglyphic, and symbolic characters are found in those of the Chinese, and that the latter were a colony from Egypt. Koch, *Tentamen Enucleationis Hieroglyphicorum quorundam Nummorum* (St. Petersburg, 1788-'9), believed that he had found five alphabets on the coins of Hasmonein, on the images of Isis, and on a sphinx. George Zoëga, a learned Dane, wrote an excellent work, *De Obeliscis Romæ* (1797), and *De Origine et Usu Obeliscorum*. Aided by a knowledge of Coptic, and a good collection of later Greek writers, he distinguished mere figures from real hieroglyphs, determined their number, asserted that the elliptic rings (*cartouches*) contain proper names, as Barthélemy had suspected, and first applied the term phonetic to hieroglyphs, although he yet believed, with Ammianus, that letters might denote words. Zoëga's disquisitions were repeated by James Bailey, *Hieroglyphicorum Origo et Natura* (Cambridge, 1816), but he denies the congruence of the Greek.

text on the Rosetta stone with the hieroglyphic, where he supposes that the priests wrote, in their own favor, something else than what the Greek contained.—A bright period dawned on Egyptology with the discovery of the Rosetta stone by Bouchard (1799), while digging in the fort of St. Julian. W. R. Hamilton, the author of *Ægyptiaca*, sent it to England (1802), after its inscriptions had been printed at Cairo. It is of black basaltoid granite, a parallelogram in shape, originally rounded at the top. It contains three inscriptions: the highest in hieroglyphics, of which the 14 remaining lines are all somewhat mutilated on the right, and 12 also on the left; the middle one in demotic characters, in 32 lines, of which 15 are mutilated on the right; and the lowest in Greek of 54 lines, of which the lowest 27 are injured on the right. The first two inscriptions are in the Egyptian language, and versions of the original Greek composition, which is a decree of the guild of the priests of Memphis, in honor of Ptolemy Epiphanes (March 29, 195 B. C.) after his victory over the Ætolian rebels. Heyne and Porson restored and elucidated the Greek text. Sylvestre de Sacy (1802) distinguished the demotic groups corresponding to the names of Ptolemy, Arsinoë, and Alexander. Akerblad, a Swede (1802), well versed in Coptic, analyzed the above and 13 other names and words of the demotic (ϣϣωρη) text, such as *Chemî*, Egypt, *phuro*, king, *ueh*, priest; found the characters denoting 1, 2, 3; made out an alphabet of 16 characters; but he did not suspect the symbolic signs, or the omission of the medial vowels, while believing the enchorial to be hieratic. Several memoirs and plates in the great *Description de l'Égypte pendant l'expédition de l'armée Française* (Paris, 1809-'43) treat merely the material part of the inscriptions, distinguish them from the scenic figures, notice some symbols mentioned by Greek writers, and give two good copies of the Rosetta stone; but they contain many errors as to astronomical representations and as to the age of the monuments. Dr. Thomas Young made a conjectural translation of the Rosetta inscription (published by Broughton in the "Transactions of the Antiquarian Society," May, 1815; revised in the *Museum Criticum*, Cambridge, 1815). Young studied the Coptic, and proceeded in a mathematical manner to compare the various texts and groups of characters, though without deep philological explorations. He employed Akerblad's alphabet in deciphering the contents of the rings, which he believed to be the names of various kings, in the manner of the Chinese. He distinguished about 100 characters, 50 groups of words, and 150 corresponding to Greek words; explained several of them rightly; discovered the numeral signs of 1, 10, 100, 1,000, and 10,000, from enchorial bills of sale and receipts; distinguished later the enchorial from the hieratic method, deriving both from the hieroglyphs, and arranged them (1823). He found no Rosettan hieroglyphs in the so called "Book of the Dead," and be-

lieved all hieroglyphs to be ideogrammatic, except in proper names. Thus he thought that a hammer denoted God, and a man pouring out from a vessel, a priest. He suspected syllables in the enchorial characters, but had no idea of homophonous characters or of a satisfactory alphabet, although he had (1816) agreed with the French commission that the demotic text of Rosetta was alphabetic, and although he afterward (1823) claimed the discovery of an alphabet. Out of 20 rings or shields he read but two rightly, and explained out of the 13 signs in Ptolemy and Berenice only three exactly and approximately. His labors are also recorded in the "Hieroglyphics of the Egyptian Society," and in his letters to De Sacy (1814-'15), to Archduke John (1821), in the supplement to the "Encyclopædia Britannica," vol. iv. (1819), and, after his death, in an appendix to Tattam's "Egyptian Grammar," and in the "Rudiments of an Egyptian Dictionary" (London, 1830).—J. F. Champollion published *L'Égypte sous les Pharaons* (Paris, 1814), and was, independently of his own genius, led into the right path both by the successes of Akerblad and Young, and by hints derived from Caillaud, who had delineated a Greek inscription on the base of a small obelisk at Philæ, that had been dug out in 1815 by William Banks, who set it up in 1821 at Kingston hall, Devonshire, and sent copies of it to all Egyptologists, with the notation of 5 letters (*p t o l e* and *l e o p t*) in the names of Ptolemy Evergetes II. and of two Cleopatras, one his sister, the other his wife. Champollion says in his work *De l'écriture hiéroglyphique* (1821) that the hieroglyphs are symbolic and not alphabetic; but he both corrects himself and acknowledges Young's merits in the *Lettre à Dacier* (1822), in which he reads Ptolemy and some other names rightly. He published *Panthéon Égyptien* (1823), and *Précis du système hiéroglyphique* (1824), in which he teaches that the phonetic characters are true letters expressive of the sounds of the language; that all methods of writing, even in common words, consist of both ideograms and phonograms, which latter constitute about $\frac{1}{4}$ of the characters in all hieroglyphic texts; and that the ancient language was essentially the same with the Coptic. He enriched and improved Akerblad's alphabet, read about 50 names of Cæsars and kings, without being able to decipher all the name shields, recognized many *homophona* (characters of things whose names begin with the same sound), and determined rightly most of the grammatical forms, but neglected the study of the demotic graphic system. Having passed 16 months in Egypt and Nubia, with Salvador Cherubini, who made many drawings, he wrote his *Grammaire Égyptienne*, published at the expense of the French government (1836-'41), and *Dictionnaire Égyptien*. (1844).—Sickler, who wrote (1819-'22) on the hieroglyphics in the myth of Æsculapius, and on the sacred language of the priests, fancied that all hieroglyphs were paronomastic (rebus-like, as, for instance, the

images of a bridge and of a man for the name of Bridgeman); but, being ignorant of Coptic, he Semiticizes every thing. J. G. L. Kosegarten, *Bemerkungen über den Aegyptischen Text eines Papyrus*, &c. (Greifswalde, 1824), discovered several grammatic forms and the names of several Ptolemies. Heeren suspected the phonetic nature of the hieratic writing. Julius Klaproth, a violent opponent of Champollion, follows Horapollon in his *Lettre sur la découverte des hiéroglyphes acrologiques* (Paris, 1827); he says that each hieroglyph denotes all Coptic words commencing with the sound of the name of the depicted object; thns: *mur*, rope, denotes also *mei*, love; *mulaj*, owl, denotes also *mu*, death; *af*, fly, also *anoni*, impudence, &c. Guilianoff, in his *Recherches sur l'expression des signes hiéroglyphiques* (Leipsic, 1839), believes that they originated from the demotic and hieratic, with the aim of concealing the meaning of the inscriptions. Janeli, of Naples, in his *Fundamenta Hermeneutica Hieroglyphica Critica Veterum Gentium, and Tabula Rosettana Hieroglyphica et Centuriæ Sinogrammatum Polygraphice Interpretatio per Lexicographum Temurico-Semiticum* (Naples, 1830), considers the hieroglyphs, sphenograms, sinograms, and the Etruscan, Oscan, and Runic writings as a mystical system. Rosellini, a disciple of Champollion, who examined with him many monuments at Turin and elsewhere in Italy (1825-'6), wrote *Sistema geroglifico del Sig. Champollion il minore* (Pisa, 1825), and *Tributo di riconoscenza e d'amore alla onorata memoria di G. F. Champollion* (1832); he was sent to Egypt by the grand duke of Tuscany in 1828, and published *Monumenti dell'Egitto e della Nubia: I. storici; II. civili, i del culto* (1843). Salvolini, another disciple of Champollion, accused of having used the papers of his master for his own purposes, wrote *Lettre à l'abbé Gazzera, &c.* (Paris, 1832), examined the hieratic text of Sallier's papyrus, from which he drew his *Campagne de Rhamsès le Grand (Se-Sothis, son of Sothis or Sesostris, about 1400)* (1831-'5); and *Analyse grammaticale raisonnée de différents textes Égyptiens: vol. i., Texte hiéroglyphique et démotique de la pierre de Rosette, &c.* (1836). This was the first phonetic elucidation of the Rosetta stone. He explains 100 characters of Champollion and as many of his own, but without much philological profundity. Richard Lepsius, the most sagacious, learned, and diligent Champollionists, employs the scrutiny of writing as an efficacious means of scrutinizing languages. He has published *Lettre à Rosellini sur l'alphabet hiéroglyphique* (Paris, 1837); *Das Todtenbuch der alten Aegypter nach dem hiéroglyphischen Papyrus zu Turin* (arranged by Seyffarth, and wrongly called *rituel funéraire* by Champollion); *Auswahl ägyptischer Urkunden* (Leipsic, 1842), after his return from Egypt and Ethiopia, whither he had been sent by the king of Prussia in 1842; *Denkmäler aus Aegypten und Aethiopien* (1842-'5), and *Briefe* (Berlin, 1852); *Ueber eine hiéroglyphische Inschrift am Tempel zu Ed-*

fu (1855); and *Königsbuch der alten Aegypter* (1858). He has modified the views of Champollion; discovered 11 characters, and distributed 34 among 15 sounds of the Egyptian language; showed that certain figures were chosen in certain places on account of symmetry in the inscriptions; distinguished more clearly the ancient characters from those that were employed later; and shown the analogy by examples, for instance CLEOPATRA written thns: *Keli*, knee; *Laboi*, lion; *Eake*, reed-leaf; a flower for O; a square for P; *Achöm*, eagle; *Tot*, hand; *Ro*, mouth; and *Achom*—(O and P without corresponding Coptic words). He also shows that there were characters of mixed elements, both phonetic and symbolic. M. G. Schwarze, *Das alte Aegypten* (Berlin, 1843), endeavored to evolve Champollion's system genetically, although he had little faith in a perfect understanding of the hieroglyphs. (See COPPIO LANGUAGE.) Chr. C. J. Bunsen, *Aegyptens Stelle in der Weltgeschichte* (Hamburg, 1845, and Gotha, 1857), is an admirer of Lepsius, and endeavors with great effort to establish a theory of his own on the development of man's history, in a mystic and metaphysical way. He furnishes a grammar and various lists of Egyptian words.—A school of a method different from that of Champollion was inaugurated by Fr. A. Spohn's work, *Ueber Hieroglyphen und ihre Deutung und über die Sprache der alten Aegypter* (Leipsic, 1820), in which he asserts that both the hieratic and demotic styles are altogether phonetic, and that the hieroglyphs alone are symbolic images. Gustav Seyffarth (who since 1856 has resided in the United States) edited Spohn's *De Lingua et Literis Veterum Aegyptorum* (Leipsic, 1825-'31), and has developed his own views on a great variety of topics in many works and in many articles scattered through periodicals. The most prominent of them are: *Bemerkungen über einen ägyptischen Papyrus, &c.* (1826); *Rudimenta Hieroglyphorum* (1826); *Brevi Defensio Hieroglyphices Inventæ a Spohn et Seyffarth* (1827); *Beiträge zur Kenntniss der Literatur, Kunst, &c., der alten Aegypter* (very mystical and dogmatic, occasioned by a passage of Ohæremón, in *Iamblichus de Mysteriis Aegyptiacis* (1833); *Alphabetum Genuinum, &c.* (1840); a syllabary sent to prominent Egyptologists, and *Grammatica Aegyptiaca* (Gotha, 1855); on the "Fable of Abydos," edited by Burton, Cairo, 1827 (1846); *Theologischen Schriften der alten Aegypter nach dem Turiner Papyrus zum ersten Male übersetzt* (1855), &c. Seyffarth has repeatedly altered his views, and has put forth many theories, as for instance that the demotic style was originally like the Phœnician, and that the hieroglyphics were but calligraphic modifications of the hieratic. He has taught that all hieroglyphics are phonetic, both alphabetic and syllabic; that the ancient form of the Coptic was their language, whereas Champollion insists on the modern Coptic. He also claims the doctrine of homogeneity of assonance

and of syllabism as his own. Dr. Max A. Uhlemann founds a system on Scytharh's principles, with whom he disagrees in some things, and has written a great number of exegetical and controversial works. He uses the Hebrew in the interpretation of certain cases, where no Coptic equivalent can be found. The most recent Champollionist, who also especially treats of the demotic style (after the few hints by De Sacy, Akerblad, Young, and Spohn), is Henry Brugsch, a pupil of Passalacqua, and a voluminous writer. He has explained more than 100 new demotic characters, and made many other discoveries.—Champollion distributes the hieroglyphics into 3 classes: 1, the mimetic or figurative, expressing objects by their images; 2, the tropic, of 4 kinds, expressing objects, *a*, by synecdoche, a part for the whole figure; *b*, by metonymy, cause and effect mutually, as eye for sight, starry sky for night; *c*, by metaphor, as bee for king, lion for superiority; *d*, by enigma, as ostrich feather for justice, palm twig for year; 3, the phonetic, of more frequent occurrence than the others. Lepsius establishes four classes: 1, ideograms, subdivided into figurative and symbolic or tropic; 2, phonograms, either alphabetic or more amplified (with syllables) under the Romans; 3, intermediary (mixed) or conditional phonograms, that is, ideograms that became phonetic in certain words, either initial or in the second place; 4, determinatives, including not only those of Champollion, but also his grammatical signs which are not phonetic, as 11 to denote the dual, 111 the plural, &c. To these distinctions he adds seven sources of information: 1, additional signs, as the image of writing materials near the figure of the scribe; 2, bilingual inscriptions; 3, variants in different copies of the same text; 4, correspondence with Coptic words; 5, phonetic complements to initial ideograms, as lyre (N), snake (F), and mouth (R), meaning *nafre*, good, while the lyre alone is the symbol of good; 6, many phonograms under the Romans that had been ideograms under the Pharaohs; 7, observations in Diodorus, Plutarch (thus, that *iri*, eye, with sceptre denoted Osiris; properly, *Hes*, throne, + *iri*, eye), Clement, Eusebius, &c. The hieratic and demotic writing differ less from each other than do the respective idioms. Of the old language we find some words preserved in various authors; for instance, in Pliny: *alabas-tritis*, from *al-ubash*, stone-white; *giris*, *iaro*, *ieor* (Xile); *seris*, *sares*, a plant; in Plutarch: *αμεθης*, *amenti*, infernal region; Memphis, *μαννυfi*, goods (of) port; *σαυρι*, *shauri*, festival; *Χημία*, *Chemi*, Egypt; in Clement: *αρπεδο-ναπται*, *erpe-nebet*, servant (of) temple; in Horapollo: *baï*, *p-ah*, soul; *baïeth*, *bait*, hawk; *eth*, *het*, heart; *Noun*, *nun* (abyss), Nile; *Sôthis*, Sirius (dog star); in Herodotus: *βαπς*, *bart*, ship; *καλοσιρις*, garment; *πιρωμις*, *pi-romi*, the man; *χαμφαι*, *p-emsuch*, the crocodile; in Josephus: *εκ-σως*, king-shepherd, &c. This ancient language flourished for 2,000 years. There are few stelas, or monumental stones, in both dialects, and the hieratic tachygraphy arose later. The Saidic

was the last period of beautiful hieroglyphics; it was followed by demotic bilinguals (ancient and demotic, or MuT SHAI, language (of) books), for daily use in contracts and sales, as found at Thebes. Manetho (*Ma-n-Thôth*, given by Thoth, 280 B. C.), a learned priest of Seben-nytos, calls the ancient letters *ιερογραφικα*. The demotic, SCHI ReM eN KeMi (writing men of Egypt) was in use before Herodotus visited Egypt, as early as 665, during the reign of Psammetichus, and lasted down to A. D. 300. The Coptic commenced taking its place as early as the Ptolemies. (See COPTIC LANGUAGE.) Letronne (1851) separates the demotic from the Coptic at the close of the 4th century; but Lenormant and J. H. Vincent prove their coexistence for almost two centuries. Sprung from the hieratic, the enchorial (demotic) from Psammetichus to the Ptolemies (665–305) is found in contracts which are now in Turin. Its later monuments in the most elegant form, under the Romans, are at Leyden, in Gnostic papyri with Greek between the lines. Ideograms are found in both the hieratic and demotic styles. Sculptured or painted hieroglyphics are to be distinguished from linear ones, which are their abbreviation. The original figurative hieroglyphics lack that elegance which is admired in the monuments of Thebes. It would nevertheless be vain to search among them for traces of the infancy of writing, as most edifices in Egypt belong to a period of restoration in arts and civilization, which had been interrupted by an invasion of barbarians (2000 B. C.). Before that invasion the monuments may be called perfect; their decadence, begun under Sesostris, continued under Sabaco (736) and the Saïtes (677–525; 404–399), and advanced under the Lagides until their end under the Romans.—Champollion arranges all hieroglyphics under the following 16 heads: celestial bodies, man, limbs of the human body, quadrupeds, birds, reptiles, fishes, a few insects, plants, garments, furniture and arms, vessels, tools, buildings, geometric figures, and monsters; they amount to 480 in Bunsen, but reach almost 900 if all variations be included. They are found in relief or carved outlines, or in relief on a depressed ground, each one colored. Hieroglyphic texts are also traced in black or in red on the walls of tombs, and on a smaller scale on the covers of mummy cases, stelas, &c. Three sorts of monumental writing were used: sculptured without color, sculptured and painted, or designed with color and painted. The colors of the different objects were regulated by rules. Linear hieroglyphics were abbreviations of the original natural images, a sort of skeletons. From the re-abbreviation of these arose the hieratic or priestly writing, a sort of short hand for recording events, scientific and other data; and this method consisted of several varieties, distinguished by greater or less similarity to the prototype. Both full and linear hieroglyphics were disposed in several manners: in vertical columns downward, in horizontal lines, and in both directions, either from right

to left or *vice versa*; in every case always observing the law of tasteful symmetry in the collocation of one figure alone or two or three figures together, so as to fill the lines. Hieratic writing ran always from right to left. In some funeral manuscripts we find hieroglyphics and hieratics both used. Anaglyphs (engravings) were engraved or raised figures symbolic of astronomical and probably also of other objects. The symbols used in chemistry are also of Egyptian origin.—We have already mentioned various opinions relative to the language of the hieroglyphics, and we shall now add a few observations on the same subject. Quatremère demonstrates the independence of the Mut of Chem. Lepsius, insisting on the original identity of the Aryan or Indo-European, Semitic and Coptic families, yet allows to each its individuality. Schwartz declares the last named to be analogous to the Semitic by its grammar, and to the Aryan by its roots. Benfey divides the Semitic family into two branches, separated by the isthmus of Suez, viz., the Asiatic and the African, adding to the Coptic all idioms of northern Africa. According to Bunsen, the Egyptian language is a pre-historic deposit of Semitism, whose roots and forams are only explicable by Aryo-Semitic elements together. Rougé finds that the Egyptian resembles the Semitic in proportion to its antiquity. Ewald protests against this Semitomania. The similarities in the personal pronouns, in many vocables, especially numerals, in the agglutination of accessory words, in the assimilation of consonants, and in the instability of vowels, can be explained by laws of logic and by mutual intercourse among the nations, without recourse to the theory of identity. Egyptian civilization has nothing in common with that of the Semitic nations; the physical traits of the races are also distinct from each other. But the method of suffixes to nouns and to verbs is also of Turanic (Allophylic, Tshudic, &c.) character. Chamitic (Egyptic) is, therefore, the most proper epithet for the language of the hieroglyphics, which may be conveniently grouped with the non-Semitic tongues of Abyssinia, Nubia, and perhaps with the ancient Libyan and Numidian or Berber. Several characters were regularly used to denote the same sound, and are called homophonous, many of them for the purpose of artistic symmetry. Their number was increased during the rule of the Lagides and Romans; Latopolis (Esneh) was thus written by 10 different groups, each of which contained the sign of city with the alphabetic signs SN. The Champollionists contend that figurative, symbolic, and phonetic characters occur mixed in all texts, the last predominating; while the Seyffarthists contend for pure phonetism, both alphabetic and syllabic. Bunsen adds 120 symbolic characters, 120 phonograms of all ages, 72 syllabic groups, and 50 mixed groups, to the above 460 iconic ideograms. Of Champollion's 260 phonograms of all ages, the following are adopted as certain, viz.: 3 for A, eagle (*achom*), reed leaf (*achi*),

and arm (*amschoir* ?); 1 for I, two reed leaves; 3 for U, chicken, convolute line (also for F), and a sort of noose; 1 for B, foot; 1 for P, square; 1 for F, snake; 3 for K, quadrant, basket (*kot*), and knee (*ka*); 2 for CH guttural, sieve and lotus; 2 for H, chain and house plan; 3 for T, semicircle, hand (*tot*), girdle, &c.; 3 for S, siphon (or back of a throne), bolt, and goose; 2 for SCH, garden, and parallelogram with line within; 4 for M, owl (*mula*), shuttle, sickle, and parallelogram with protruding horizontal lines; 3 for N, wave-line (*Nun*, Nile), urn (*nu*), and red (*tescher*) or lower crown; 2 for R and L, mouth (*re*) and lioness (*laboi*, Coptic); beside 18 more for Coptic hissing sounds. As regards the vowels *e*, *o*, and even *a*, *i*, *u*, they were mostly omitted, so that ambiguity of meaning could only be avoided by the sense of the context; thus NB signifies lord (*neb*), or gold (*nub*). T final denotes the feminine gender; thus: SN, brother, SNT, sister; SI, son, SIT, daughter, &c. Brugsch tries to make out 25 consonants (8 more than in the Coptic), by the aid of Semitic sounds. In his demotic scheme he gives for 17 sounds 42 characters (about 70 with all varieties); for *a* 7, *i* 1, *u* 3, *v* 2, *v* (*phi*) 1, *b* (*psi*) 2, *m* 2, *n* 2, *l* 1, *r* 2, *s* (*z*) 3, *t* (*d*) 3, *h* 3, *k* (*chi*) 4, *ch* 3, *s* 2, *t* (*z*) 1. To these he adds 46 syllabic signs for 35 syllables. Compound names were represented by the image of the object with a symbolic character, as the signs for house and truth, denoting temple; or by a phonogram with the image, as show with face, denoting mirror; or by a phonogram with a symbol, as workman with gold, signifying goldsmith; or two phonograms. Obscurity of sense from the omission of vowels was remedied by the addition of determinative signs. These were images or symbols joined with phonetic words, and were either generic or specific; thus the determinative of names of animals was the image of a skin, of those of plants a leaf, &c.—We subjoin a few particulars relative to the grammar. Article: *P* (*pa*, *pe*, *pi*), Greek *o*; *T*, *i*; plural *N*, common gender. As a demonstrative it has the adjoined vowels *ai* or *ei*, and when post-positive *en*, but plural *APU*. Examples: *Pa PeTTi SuTeN*, the bow-bender (of the) king; *Na NeB-U*, the lords; *Tai UNU*, this hour; *eM MaU APU*, in waters these. Demonstrative with relative: *Pui* (*pefi*), he who; *Tui*, she who. Other pronouns: *eNTi* (of common gender), that which; *K*, other; *SA*, some; *NeB*, all, &c. Example: *NeTeR NB*, *NeTeRT NeB eNTi eM PeT*, gods all, goddesses all that in heaven (are). Suffixes of persons: 1st person, *-I*; 2d person, *-K* masculine, *-T* feminine; 3d person, *-F* masculine, *-S* feminine; plural, 1st, *-eN*, 2d, *-TeN*, 3d, *-SeN*, making possessives with the preceding pronouns; thus: *PaI*, Gr. *o* μου, Germ. *der meinige*; *Tai Sen*, *i* αυτου (she of them). Example: *URoI*, Magyar *király-om* (king-my); *URoK*, *király-od* (king-thy); *URoT* (queen-thy), &c. So also in the conjugation of verbs: *ANCHI*, Latin *viv-o*, Magyar *él-ek*; *ANCH-*

eK, *viv-is*, masc., *él-sz*, -*eT*, fem.; *ANCH-eF*, masc., -*eS*, fem., *viv-it*, &c. Duality was noted by doubling the character, or by two strokes; plurality by trebling it, or by three strokes. Personal pronouns: *ANoK*, I; *ANoN*, we; *enN-Tok*, masc., *eNTA*, fem., thou; *eNTuTeN*, you; *eNTuF*, he, *eNTuS*, she; *eNTeSeN*, they. Comparative and superlative were denoted by repetition of the name, or by *eN*, the sign of the genitive, or by *eHoTe*, more than.—The numeral characters were only five, capable of indicating all numbers, to wit: a line or post (*Uot*), 1; a sign like a horse shoe turned downward (*MeT*), 10; a convolute line, like the letter U or F (*HaTi*), 100; lotus (letter CH, Coptic *scho*, or *schu*), 1,000; finger (*TeBa*), 10,000. Fractions were indicated as with us, only that the line between the numerator and the denominator was represented by the sign of mouth (*Re*, which signifies also part, separated).—Of verbs, there were five auxiliaries, viz.: 1, *Pa* (also an article), as in *Pa eM SeKIT UBSeSCH* (Latin, *Sunt ex granis albis*; that is, *panes*); 2, *AU* (hook): is *AU TU-KMA-T*, is voice-thy truth-she; 3, *AR* (Latin, *Or-ior*) is, are: *AR MeHI* II *eM APeF*, are plumes two on head-his; 4, *UNu*, to exist; 5, *IRI*, to do, to make (of later times). The negative *Ne* was represented by two repelling arms, sometimes with a sparrow on his back under them, thus: *Ne SuTeN eN KeMi IRI SA*, no king of Egypt did so. The present tense (as above) sometimes had -*Au* inserted when used as imperfect, or aorist. The characteristic of the preterite is *eN*-. The future is preceded by the conjunction *AU*, thus: *AU-A-R IRI*, is I to(ward) do (analogous to the Italian *sono per fare*, I am about to do), &c.; the optative by *MAI*; the imperative by *MA*; the infinitive by *eR* or other particles. The active participle has *eNT* (he who) prefixed, or -*Tu* suffixed; the passive voice, -*uT* or *Tu*. In inscriptions the sole theme of the verb performs all functions of conjugational accidents. (See CHINESE LANGUAGE.)—The prepositions are: *eN*-, sign of genitive and ablative, also through, by; *HeM*, in (place); *eM*, in, from, by means of, to, &c.; *eR*, dative, toward, for; *Pe* (heaven), upon, up, on; *IRa* (face, Latin *coram*), on, to, with infinitive; *KeR* (box, stool), under, Lat. *apud*, &c.; *CHaR*, toward, till, near; *SCHA* (measure), according, command; *HNA*, with, against; *MA*, instead of. Compound prepositions are found, as *eN HRa HeI*, Lat. *coram corde* (in presence of the heart, in conscience); they are also found with the personal suffixes, thus: *eR Ma-K*, to stead-thy (to thee), &c. Adverbs and conjunctions from prepositions: *Ma*, here; *eR HRa Pe*, upward; *eM HRa Pe*, downward; *eR HeT* (to heart), before, &c.; *SeP*, time, times; *HeR*, *KeR*, *KI*, also, and; *AS*, then, as; *CHeR*, since; *HAU NeB* (Lat. *die omni*), every day; *SIF*, yesterday, &c. The following are examples of the syntax: *ARNeF MeMeNN-U-F eN AT-F AMeN-RA*—Lat. *Ererit edific-ia-sua (hac) -i patr-*. *AmenRa A U HA NAN eN SuTeN-*

SheB NTARASH (Darius) *ANCH IA eR KeM*—*Ac sanctitas -is reg- (regis) utriusque (regionis) Darius sempiternus (jubet me ire) in Egyptum. Ra-MeN-TeR—Sol servator mundi. URuS SoR MU-MU-SoL She NoFR TeN Ka-PTa*.—*Regnans potens magnæ-famæ qui beavit (regionem) Ai Gy PTao* (land of Phia, or because *δ Αιγυπτος*, the Nile, in Homer is *Ai-ski-pe-tosh*, makes-fertile-the-land).—The advantages resulting from the study of the Egyptian graphic methods are so numerous and important for glossology, chronology, geography, ethnology, for history in general and especially that of useful and liberal arts, that it would take us beyond our present limits to expound them in detail. Indeed, the wonderful monuments of the most ancient age of human activity would be mute or unintelligible witnesses, without the interpretation of their epigraphs. All notices of ancient writers concerning Egypt would but bewilder us, unless we possessed a Lydian stone in the pyramids and obelisks, whereby to prove their veracity. Herodotus would yet be considered a liar, had his truthfulness not been attested by the voice given out by lifeless stones. The lists of the Pharaohs in the reliefs of Manetho would also be worse than useless, unless they stood corroborated and in some instances corrected by a comparison with indubitable synchronic records beyond the reach of perversion or interpolation. We thus possess the most trustworthy data, by which not only what concerns Egypt, but also the history of the Phœnicians, Assyrians, Babylonians, Greeks, Hebrews, and Persians, is either revealed, or illustrated or disproved in many of its hitherto received particulars. The very methods of historic exegesis have undergone an essential alteration, in consequence of our having obtained a certain material basis whereon to rear a temple of truth, against which neither prejudice, pedantry, nor designed misrepresentation can prevail.—See De Belestat, *Discours sur les hiéroglyphes Égyptiens* (Paris, 1583); Rossi, *Horæ Egyptiacæ* (Rome, 1808), an excellent work on the Egyptian language; J. Burton, *Excerpta Hieroglyphica* (fol., Cairo, 1825-'8); Robiano, *Études sur l'écriture hiéroglyphique et la langue des Égyptiens* (Paris, 1834); Ungarelli, *Interpretatio Obeliscorum Urbis Romæ* (1842); Letronne, *Recueil des inscriptions Grecques et Latines de l'Égypte* (1842); Benfey, *Verhältniss der ägyptischen Sprache zu der Semitischen* (Leipsic, 1844); De Sauley, *Analyse grammaticale du texte démotique de la pierre de Rosette* (1845); Rougé, *Mémoire sur l'inscription du tombeau d'Ahmès, chef des navonniers* (1851); Leemans, Birch, Senkowsky, Hawkins, Belmore, Prisse d'Avennes, Dunbar, Heath, and others, on papyri and other monuments; Sir G. Wilkinson, *Materia Hieroglyphica*, and many other works; M. Uhlemann, *Handbuch der gesammten ägyptischen Alterthumskunde* (Leipsic, 1857); H. Brugsch, *Grammaire démotique, and Géographie des Aegyptens*, &c.

HIERONYMUS. See JEROME.

HIEROPHANT (Gr. *ιεροφάντης*, from *ιερος*, sacred, and *φάνω*, to make known), the presiding priest in the Eleusinian mysteries, who conducted the ceremonies of initiation. He could be chosen only from the family of the Eumolpidae, whose ancestor Eumolpus was regarded as the founder of the mysteries. His body must be without defect, his voice sweet and sonorous, and his life without reproach. If he married, he thereby renounced the sacred office. A diadem adorned his brow, his hair hung down over his shoulders, and in the mysteries he represented the creator of the world with mystical symbols. He preserved and transmitted the secret and unwritten knowledge which was the object of the institution. In the last ages of paganism the hierophants seem to have become thaumaturgi and magicians.

HIGGINSON, FRANCIS, an English clergyman, and the first teacher of Salem, Mass., born in 1587, died in Salem, Aug. 6, 1630. He was educated at Cambridge, England, and subsequently became rector of a parish in Leicester. Becoming gradually a nonconformist, he was deprived of his benefice, and was employed among his former parishioners as a lecturer. While apprehending an interruption in these duties in the shape of a summons to appear before the high commission court, he received an invitation from the Massachusetts company to proceed to their colony, which he accepted. He embarked early in May, 1629, and it is related by Cotton Mather that as the ship was passing Land's End, he called the passengers about him and exclaimed: "We will not say, as the Separatists were wont to say at their leaving of England, 'Farewell, Babylon; farewell, Rome!' but we will say, Farewell, dear England! farewell, the church of God in England, and all the Christian friends there. We do not go to New England as Separatists, though we cannot but separate from the corruptions of it. But we go to practise the positive part of church reformation, and propagate the gospel in America." He arrived at Salem June 29, and on July 20 was chosen teacher of the congregation established there, Samuel Skelton, his companion on the voyage, being chosen pastor. Each of them consecrated the other by the laying on of hands, assisted by several of the gravest men. Subsequently Higginson drew up "a confession of faith and church covenant according to Scripture," which on Aug. 6 was assented to by 30 persons, who associated themselves as a church. On this occasion, says Palfrey, "the ministers, whose dedication to the sacred office had appeared incomplete till it was made by a church constituted by mutual covenant, were ordained to their several offices by the imposition of the hands of some of the brethren appointed by the church." Higginson continued to discharge the duties of his office until the succeeding year, when, in the general sickness which ravaged the colony, he was attacked by a hectic fever

of which he ultimately died. He wrote "New England's Plantations, or a Short and True Description of the Commodities and Discommodities of the Country" (4to., London, 1630), and an account of his voyage, which is preserved in Hutchinson's collection of papers.—JOHN, son of the preceding, born in Claybrook, England, Aug. 6, 1616, died in Salem, Mass., Dec. 9, 1708. He emigrated to New England with his father, adopted the profession of a preacher, and for many years was settled over a congregation at Guilford, Conn. In 1660 he was ordained pastor of the first church in Salem, of which his father had been teacher, and where he remained until the close of his life, at which time he had been 72 years in the ministry. He was a zealous opponent of the Quakers, although he subsequently regretted the warmth of his zeal; but he took no part in the proceedings respecting the witchcraft delusion in 1692. He is the author of a number of occasional sermons and miscellanies, including the "Attestation" to Cotton Mather's *Magnalia*, prefixed to that work (1697), which has been highly praised for its eloquence. He was greatly venerated in New England, and according to the testimony of Cotton Mather preserved his intellectual faculties unimpaired to the close of his long life.

HIGH SEAS, an ancient law term, the origin of which is not certainly known. The probable derivation is from *mare altum*, the word *altum* meaning deep as well as high. It was applied to the sea in the sense of deep; but its more common meaning being high, the phrase was translated "high seas." It is adopted here, and in frequent use in the laws of the United States. Its exact meaning is not quite certain, even in those laws. Story says it means there, or at least in one of them, all the ocean waters beyond low water mark. But out of those statutes, and for some purposes in them, it has been supposed that the word means only the ocean waters, outside of any *faucis terræ*. In this case it would not include bays or estuaries between headlands. But here also it is difficult to say what projection of the headlands, or what nearness to each other, is necessary to make a *mare clausum* and shut out the included waters from the *mare altum*, or the high seas. It has been suggested, and by writers of authority, that they must be so near each other, that a person standing upon one can distinguish the features of a man standing on the other, sufficiently to recognize him if he knows him. It has also been recently held in Massachusetts (Dec. 1859), in a case of much public interest, that water included between projecting headlands is not within the body of a county, unless they are so near each other that a person standing on one may not only recognize a man on the other, but discern what he is doing. But neither of these can be considered as a settled rule.

HIGHLAND. I. A central co. of Va., bounded N. W. by the principal ridge of the Alleghany mountains, and S. E. by the Shenandoah range; area, 425 sq. m.; pop. in 1850, 4,227,

of whom 364 were slaves. The S. branch of the Potomac and some of the head streams of James river rise within its limits. The surface is diversified, but consists chiefly of table-land, with a rich soil. It is well timbered, and affords excellent pasturage. Iron ore is found in some parts. The productions in 1850 were 54,241 bushels of Indian corn, 22,456 of wheat, 34,644 of oats, 26,662 lbs. of wool, 83,067 of butter, and 6,354 tons of hay. There were 3 grist mills, 10 churches, and 135 pupils attending academies and schools. Value of real estate in 1856, \$1,282,956. Capital, Monterey. II. A S. co. of Ohio, drained by Paint and Rattlesnake rivers; area, 555 sq. m.; pop. in 1850, 25,781. Its surface is elevated and uneven, and its soil fertile. The productions in 1850 were 1,578,967 bushels of Indian corn, 191,556 of wheat, 170,400 of oats, 11,426 tons of hay, 474,492 lbs. of butter, and 83,920 of wool. There were 25 grist mills, 29 saw mills, 8 woolen factories, 16 tanneries, 57 churches, 2 newspaper offices, and 6,376 pupils attending public schools. The Marietta and Cincinnati railroad crosses the county, and a branch of it extends from Hillsborough, the capital, to Blanchester.

HIGHLANDS, a name applied to the N. and N. W. districts of Scotland, in contradistinction to the S. and S. E. parts, which are called the lowlands. Their exact boundaries are unsettled. The Grampian hills are sometimes taken as the dividing line between the two great natural divisions; but, regarded as the country of the highland clans, the highlands include all the Scottish territory W. and N. W. of an imaginary line drawn from the mouth of the Nairn in the Moray frith nearly S. E. to a point on the N. Esk, near long. 3° W., on the S. slope of the Grampians, and thence S. W. to Culross on the estuary of the Clyde. They thus comprehend more than half the kingdom of Scotland, including the whole of the counties of Caithness, Sutherland, Ross, Cromarty, Inverness, and Argyre, parts of Nairn, Elgin, Banff, Aberdeen, Forfar, Perth, Stirling, and Dumbarton, and the Hebrides. They are remarkable for their wild and beautiful scenery and the peculiar character of their inhabitants. The mountainous tracts S. and E. of the Clyde are sometimes called the southern highlands. (See SCOTLAND.)

HIGHNESS, a title of honor belonging to princes. It was formerly given only to the European sovereigns, the emperor of Germany alone having the preëminent title of majesty. The latter title was assumed by the kings of Spain from the time of Charles V., and by the monarchs of England from the time of Elizabeth. The princes of Italy took the title of highness in 1625, and were soon followed by the dukes of Orleans and the other princes of Europe. The princes and princesses of an imperial line are distinguished by the title of imperial highness, and those of a royal family by that of royal highness.

HIGHWAY, a place over which the public

have a right of passage. It may be a footpath, a bridge path, a cart way, or a road wide enough for vehicles of any kind to pass each other; and for many purposes there may be a highway over water, whether it be a running stream or a lake. The origin of the word is not certainly known; but a simple derivation refers it to the time when all public roads were raised above the surrounding fields, by the addition of materials, and for the purpose of securing a dry road-bed. In English law it is usually called the king's highway, because by the theory of that law it was considered as having been originally given by him. In the United States a highway may exist by prescription, or by the dedication of the land to the public use by the owner, which may be expressed or implied from long and uninterrupted use by the public. But as, by the law of most of the states, highways must be kept in repair by the public, no person can make a highway over his land by merely opening and surrendering it for that purpose, unless it be formally accepted by those having authority to do so; although this also may be implied from usage and lapse of time. With us, nearly all highways are now laid out by the proper officers; and when laid out, they are generally either county roads or town roads. The public have, by the right of eminent domain, full power to take land for public use, upon making compensation to the owner. But the public can take only what it needs; and as it needs for the purpose of a highway only the right of passage, or, as it is called in law, the right of way (which is what the law calls an easement), it leaves the absolute property in the land to the original owner. Whatever therefore be paid to him by way of compensation, if the highway be discontinued the right of way is lost, and the land is now in the hands of the owner, free from the easement. It is now the settled, and perhaps the universal law of this country, that the abutters upon a road, by which is meant those who own to it, own to the middle of it, subject to the public right of way. This ownership does not exist if the grant or conveyance to the abutter expressly and distinctly limited him to the edge of the road; but merely bounding a piece of land by the road has not this effect, for by the road there is meant the middle or thread of the road. A highway may be discontinued and the easement lost, either by the express action of competent authority, or by a complete nonuser for a sufficient length of time. As the public are bound to keep all highways in good repair and in good order, they are answerable in law for all damages sustained by their want of repair, in any part or any respect; and causing an obstruction, or permitting one to remain, is the same thing as a want of repair. In many states, to quicken the diligence of those whose immediate duty it is to see to the good order of the roads, double damages are given by statute if the obstruction or dangerous condition of the road had been known and not attended to.

HILAIRE, GEOFFROY SAINT. See **GEOFFROY ST. HILAIRE.**

HILARION, SAINT, founder of monachism in Palestine, born, according to St. Jerome, near Gaza about 291, died in the island of Cyprus in 371. He was the son of pagan parents, and was sent by them to Alexandria to be educated, where at the age of 15 he became a Christian. Returning to Palestine after the death of his parents, he embraced monasticism, gave away his property, and entered upon a life of remarkable austerity. He attracted to his retreat in the Syrian desert crowds of visitors. After the death of St. Anthony, he made with some of his monastic brethren a pilgrimage to the cell and tomb of the saint in Egypt. To escape as well the importunities of friends as the persecution of foes, he sailed for Cyprus, where he was soon discovered and joined by his disciple Hesychius. Hence he passed to the Dalmatian coast, and finally settled in Cyprus. A vast number of miracles are ascribed to him. His festival, which is kept on Oct. 21, was celebrated as early as the 5th century.

HILARY, a pope of Rome, successor of St. Leo I., born in Sardinia, died in 467. From the beginning of his priesthood he had been noted for his zeal for the faith and his hostility to heresy. At the "robber council" of Ephesus, in 449, he appeared as the representative of Leo, sustaining the doctrine of the church against the theory of Eutyches. He was chosen to the Roman see in 461. He improved the discipline of the church; confirmed the anathema against Nestorius and Eutyches; prohibited the long-established practice of bishops nominating their successors; forbade men who had been twice married or who had married widows to receive holy orders; held at Rome in 465 a council for reforms, and solemnly ratified the former œcumenical councils.

HILARY, SAINT, bishop of Poitiers, born in Poitiers about the beginning of the 4th century, died there, Nov. 1, 367, or according to other authorities in 368. He was probably the child of pagan parents, and was married before he was converted. About 353 he was chosen bishop of his native city. The Arian controversy was at this time at its height, and Hilary signalized himself by his zeal and his ingenuity in defence of the orthodox creed, in consequence of which he was exiled to Phrygia by the emperor Constantius II., who was an Arian. Here he employed himself in writing various works, the chief of which is his treatise on the Trinity, in 12 books. A nearer intimacy with the Arians softened Hilary's opposition, and at one time his orthodoxy was suspected; but he was able at the council of Seleucia to vindicate his faith against the charge of Sabellianism. After 5 years of exile, he was allowed to return to Gaul.

HILDEBRAND. See **GREGORY VII.**

HILDESHEIM, capital of a Hanoverian province of the same name, 16 m. by rail from Hanover; pop. 16,300. It is irregularly built, surrounded with ramparts which are now convert-

ed into promenades, and has 4 Protestant and 7 Catholic churches, a convent of the sisters of mercy, a synagogue, library, museum, 10 hospitals, a gymnasium, 9 schools, orphan and lunatic asylums, an establishment for deaf mutes, and one where about 600 children are provided with education and occupation.

HILDRETH, RICHARD, an American author and journalist, born in Deerfield, Mass., June 28, 1807. His father, the Rev. Hosea Hildreth, was a clergyman of the Congregational denomination. Mr. Hildreth was graduated at Harvard college in 1826. While studying the law in Newburyport he furnished a series of contributions to a magazine of Boston edited by Mrs. Sarah J. Hale. To these succeeded other articles which appeared in Willis's "Boston Magazine" and Joseph T. Buckingham's "New England Magazine." Having entered upon the practice of law in Boston, he abandoned it in July, 1832, to become the editor of the "Boston Atlas." In this position a series of articles from his pen in 1837, relative to the movement, then not generally suspected, for the separation of Texas from Mexico, did much to stimulate the obstinate resistance which it encountered in the free states. In the autumn of 1834 Mr. Hildreth went for the benefit of his health to the South, where he resided about a year and a half on a plantation. While here, his anti-slavery novel, "Archy Moore," was written. It was republished and favorably received in England, and in 1852 an enlarged American edition appeared under the title of "The White Slave." In 1836 Mr. Hildreth translated from the French of Dumont Bentham's "Theory of Legislation" (2 vols. 16mo., Boston, 1840). His next publication was a "History of Banks," an argument for the system of free banking with security to bill-holders, now adopted in New York and several other states. After passing the winter of 1837-'8 in Washington as correspondent of the "Boston Atlas," Mr. Hildreth resumed his editorial post as an ardent advocate of Gen. Harrison's election to the presidency, and wrote a pamphlet biography of his favorite candidate. He then abandoned journalism, and in 1840 published, under the title of "Despotism in America," a volume on the political, economical, and social aspects of slavery, to which in the edition of 1854 was appended a chapter on the "Legal Basis of Slavery." His controversial pamphlets, including a letter to Prof. Andrews Norton of Cambridge on "Miracles," were contributions to a long and exciting theological discussion in Massachusetts. A residence of three years, commencing with 1840, in Demerara, British Guiana, stimulated his anti-slavery activity; and, as the editor successively of two newspapers in Georgetown, the capital of the country, he earnestly advocated the system of free labor. His "Theory of Morals" (Boston, 1844), and his "Theory of Politics" (New York, 1853), were written during his sojourn in Guiana. These were attempts to apply rigorously to ethical and political science the same induc-

tive method of inquiry which has proved so successful in other sciences. Mr. Hildreth's principal work is his "History of the United States" (6 vols. 8vo., New York, 1849-'56). This undertaking he had projected during his life in college, and he gave to it many years of thorough deliberation and study. The period covered by the historian extends from the settlement of America to the end of Monroe's first presidential term. Mr. Hildreth has also published a historical work on "Japan as It Was and Is" (12mo., 1855). He has been a liberal contributor to various newspapers and periodicals, and his labors in editing and writing for cyclopædias and works of a similar character would alone give him the reputation of a voluminous author. One specimen of these fugitive efforts may be seen in the article on John Hancock published in the "Homes of American Statesmen." Of late years Mr. Hildreth has been a member of the editorial staff of the "New York Tribune."

HILL, a central co. of Texas, bounded W. by the Brazos river, and drained by small tributaries of that stream; area in 1853, 890 sq. m., since which time its boundaries have been changed; pop. in 1858, 2,366, of whom 508 were slaves. It consists mostly of rolling prairie, with a rich black soil, but poorly watered and rather thinly timbered. A range of hills passes near its E. boundary. It produces Indian corn, wheat, and other grains, and good pasture. Formed from Navarro and Ellis counties in 1853. Capital, Hillsborough.

HILL, ISAAC, an American journalist and politician, born in Ashburnham, Mass., April 6, 1788, died in Washington, D. C., March 22, 1851. In 1809 he settled at Concord, N. H., where he established the "New Hampshire Patriot," of which he was the sole editor for many years. He served in the senate and lower house of that state, and in 1830 was elected to the U. S. senate, where he remained 5 years. In 1836 he was elected governor of New Hampshire, and continued in office by reelection three terms. During the latter portion of his life he was enthusiastically devoted to agriculture. For 10 years he published the "Farmer's Monthly Visitor," a periodical that attained a wide circulation.

HILL, ROWLAND, an English clergyman, born at Hawkestone, near Shrewsbury, Aug. 12, 1744, died April 11, 1833. He was educated at Eton and Cambridge. He early conceived a predilection for the views of the Methodists, and while at Cambridge used to preach in the prisons and private houses. The influence of his family, however, prevented him from joining the Methodists, and he soon afterward took orders in the church of England. Whitefield's reputation was then at its height, and during his absence from his chapel Hill frequently filled his place. When Whitefield died, the Methodists looked to Hill as his successor, but the repugnance which his family entertained for the new sect induced him to decline their offers. For 12 years, however, he preached in Wiltshire, Som-

ersetsire, and Gloucestershire. In 1782 he laid the first stone of Surrey chapel, Blackfriars road, London, and for 50 years he was the chief preacher there in the winter, spending the summers in provincial excursions. He travelled over most of England and Wales, and visited Edinburgh and Ireland. He preached always without notes, and his sermons were in a colloquial, familiar strain, abounding in anecdotes, and sometimes even in jokes and puns. He published several sermons and controversial tracts, but his most celebrated work is his "Village Dialogues," first published in the "Evangelical Magazine" in 1801; the 34th edition, with additions and corrections, was published in 1824. His memoirs were written by the Rev. Edward Sidney (London, 1844), and by the Rev. W. Jones (1845).

HILL, ROWLAND, viscount, nephew of the preceding, a British general, born in Prees, Shropshire, Aug. 11, 1772, died at Hardwicke Grange, near Shrewsbury, Dec. 10, 1842. He entered the army at the age of 18, served at the siege of Toulon as aide-de-camp to 3 successive generals, in Egypt in command of the 90th regiment, and in the expedition to the Weser, and in 1808 arrived in the Peninsula with the rank of major-general. He participated in the memorable advance and retreat of Sir John Moore, and rendered important services in covering the embarkation of the British army at Corunna (1809). Returning to the Peninsula in the same year, he served throughout the war, with the exception of a few months in 1811, when he was incapacitated by illness, and distinguished himself particularly at Talavera, Arroyo de Molinos, and Almaraz. His services were rewarded by the thanks of parliament, and his elevation to the peerage in 1814 as Baron Hill of Almaraz and of Hawkestone. He closed a brilliant military career at Waterloo, where he commanded a division of the allied army. In 1828 he was appointed commander-in-chief of the army, a position he occupied with universal approbation until 1842, when, upon resigning office, he was created a viscount. Lord Hill possessed almost every quality of a great commander, and was aptly called the "right arm of the duke of Wellington," who bore frequent testimony to his strategic skill and high military capacity. His personal qualities gained him the honorable title of the "soldier's friend," and his humanity, impartiality, and care for the comfort of his men, over whom he exercised a perfect control, rendered him perhaps the most popular soldier of his time in the British service.

HILL, ROWLAND, author of the cheap postage system in Great Britain, born in Kidderminster in Oct. 1795. He showed from his earliest age a great fondness for figures, which was subsequently developed in the study of mathematics. His first occupation was that of mathematical tutor in a school kept by his father and in private families, and for a number of years he devoted himself to improving the system of school instruction and organization, with a view of pre-

paring pupils more thoroughly for the duties of active life. To his labors in this field the so called "Hazlewood system" of instruction is partly due. In 1833 he was appointed secretary to the South Australian commission, in which capacity he aided in founding and organizing the colony of South Australia. About this time the defects in the postal arrangements of the kingdom began to occupy his attention, and in 1837, after an extensive pedestrian tour in the lake district, during which the evils of the system became fully apparent to him, he published a pamphlet on the subject entitled "Post Office Reform, its Importance and Practicability." By his personal exertions he succeeded in 1838 in having the matter referred to a special committee of the house of commons, before whom he underwent a long and harassing examination, the preparation of statistics and facts for which involved much time and labor. In Aug. 1838, the committee reported in favor of a uniform low rate of postage as recommended by Mr. Hill, and at the next session of parliament more than 2,000 petitions were presented in its favor. In July, 1839, a bill to enable the treasury to carry Mr. Hill's plan into effect was introduced by the chancellor of the exchequer into the house of commons, where it was passed by a majority of 102; and on Aug. 17 the project became a law. A temporary office under the treasury was at the same time created to enable Mr. Hill to inaugurate his plan, and on Jan. 10, 1840, the uniform penny rate came into operation in all parts of the United Kingdom. The post office authorities were, however, hostile to the change, and Mr. Hill found himself without adequate support from the existing ministry or from that which succeeded it. His scheme, though only partially adopted, worked well; during the commercial depression which followed its adoption, the post office revenue went on increasing, while every other source of national income proved less productive than before. He was nevertheless dismissed from his office soon after the accession of the Peel ministry. In 1843 he was appointed one of the directors of the Brighton railway, in which capacity he projected several useful improvements. In the succeeding year a subscription was commenced for a testimonial to express the popular sense of the benefit his labors had conferred upon the country, and ultimately £13,000 was raised and presented to him. Upon the return of the whigs to power in 1846 he was appointed secretary to the postmaster-general, holding divided authority with Col. Maberly; and 8 years later, on the transfer of the latter to the audit office (April, 1854), he became sole secretary, a position which he still holds.

HILL, THOMAS, an American clergyman and mathematician, born in New Brunswick, N. J., Jan. 7, 1818. His father, a tanner by trade, was for many years judge of the superior court of common pleas; both of his parents were English. Mr. Hill was left an orphan at 10 years of age; at 12 he was apprenticed to the

printer of the "Fredonian" newspaper, where he remained 4 years. He then entered an apothecary's shop, after a year's attendance at school, and served in it $3\frac{1}{2}$ years. He was graduated at Harvard college in 1843; he completed his term of residence at the divinity school in 1845, and was settled at Waltham on Christmas of the same year. Mr. Hill is a Unitarian of the Evangelical school, but so little sectarian, or strictly denominational, that he has been invited to deliver the address before the society of Christian inquiry in the orthodox college of Burlington. He has been a frequent contributor to the periodical and occasional literature of the day, having written poems, reviews, translations, and essays for the "Christian Examiner," "Religious Magazine," "Phonographic Magazine," "North American Review," and "Atlantic Monthly," and having published sermons, lectures, and addresses, and papers in the "Proceedings of the American Association for the Advancement of Science." He has also written most of the mathematical articles for this cyclopædia. He has published an "Elementary Treatise on Arithmetic," and two other works, entitled "Geometry and Faith," and "First Lessons in Geometry." It is, however, in his investigations in curves that he has displayed the greatest originality and fertility. He has added to the number of known curves, and simplified their expression; and by overstepping the common methods of using coördinates, and introducing new combinations, he has vastly extended the field of research. It is understood that he has now in manuscript a work on curves of great value and importance. In 1859 he succeeded the late Horace Mann in the presidency of Antioch college at Yellow Springs, Ohio.

HILL, WILLIAM, D.D., an American clergyman, born in Cumberland co., Va., March 3, 1769, died in Winchester, Va., Nov. 16, 1852. He was educated at Hampden Sidney college, was one of the first converts in a widely extended revival of religion in 1787, was graduated in 1788, soon began the study of theology under the Rev. John Blair Smith, the president of the college, and was licensed to preach in 1790. Declining a pastorate, he labored two years with great vigor and success as a missionary in southern Virginia, acquired a high reputation as a pulpit orator, and in 1799 was appointed to deliver a funeral oration at Harper's Ferry in commemoration of Washington. In 1800 he took charge of the Presbyterian church in Winchester, an office which he retained till 1834. Among those who made profession of religion under his ministry was the revolutionary officer, Major-General Morgan. He removed from Winchester to the Briery Presbyterian church in Prince Edward co., the pastorate of which he exchanged after two years for that of the second Presbyterian church in Alexandria. Disqualified by age for active labor, he returned in 1838 to Winchester, where he passed the remainder of his life in retirement. He was for several years engaged in

writing a history of the Presbyterian church in the United States, only a part of which was published. In the contest which resulted in the division of that church, he favored the new school.

HILLA, or HILLAH, a town of Asiatic Turkey, in the eyalet of Bagdad, on both sides of the Euphrates, and amid the ruins of Babylon; pop. about 10,000. It is a quiet, peaceable place, with well supplied bazaars, but greatly decayed from its importance under the Sassanide shahs and the caliphs, when it was also remarkable for one of the most flourishing communities of the Babylonian Jews.

HILLARD, GEORGE STILLMAN, an American author and journalist, born in Machias, Me., Sept. 22, 1808. He was graduated at Harvard college in 1828, having during his college course excelled in every department of study, but being perhaps most distinguished for the beauty of his English composition, and the brilliancy of his declamation. In his senior year he was one of the editors of a college periodical called the "Harvard Register." For some time after taking his bachelor's degree he was a teacher in the Round Hill school, Northampton, Mass. He next entered the law school of Harvard university, and afterward studied in the office of Charles P. Curtis, Esq., of Boston, and was admitted to the Suffolk bar in 1833. In 1835 he delivered the fourth of July oration before the municipal authorities of that city. In 1839 he edited the "Poetical Works" of Spenser, in 5 vols. 8vo., with a critical introduction. In 1840 he published a translation of Guizot's essay on the "Character and Influence of Washington." In 1843 he was selected to deliver the annual oration before the Phi Beta Kappa society at Cambridge. In 1846 he delivered and published a lecture on the "Connection between Geography and History." This was the first exhibition in the United States of the principles of comparative physical geography, since unfolded by Mr. Guyot in his work on "Earth and Man." In 1846 Mr. Hillard embarked for Europe, and having completed his tour, returned in 1847, and in the same year delivered a course of 12 lectures before the Lowell institute in Boston. In 1850 he delivered an address before the mercantile library association of Boston, and in the following year the address before the New York pilgrim society. In 1852 he was invited by the city authorities to deliver the discourse on Daniel Webster, whose death had just taken place. In 1853 he edited the "Memorial of Daniel Webster" for the city of Boston. In the same year he published his "Six Months in Italy" (2 vols. 12mo.), repeated editions of which have since appeared both in the United States and England. Mr. Hillard also wrote a memoir of the late James Brown, of the firm of Little and Brown, Boston, which was printed for private distribution. Beside these works, he has prepared a series of school readers, and in 1856 edited a selection from the writings of Walter Savage Landor. He contributed to Sparks's "American Biography" a

life of Capt. John Smith, which was republished in England as an English work, and without the author's name. For some time he was one of the editors of the "Jurist," and a contributor to its pages. He wrote many articles in the "New England Magazine" while it was edited by Mr. Buckingham, and he has contributed to the "Christian Examiner" and the "North American Review." For several years he has been one of the conductors of the "Boston Courier." In the summer of 1859 he embarked for Europe a second time, and returned in the autumn, having travelled in England, Holland, and France. During his absence he wrote a series of letters which were published in the "Boston Courier." Mr. Hillard has served the state as a member of the house of representatives and of the senate of Massachusetts. He has also been a member of the common council of the city of Boston, and for 6 months its president. He held for some time the office of city solicitor, and has been assiduously occupied in the labors of his profession.

HILLEL, a rabbi and president (*nasi*) of the sanhedrim of Jerusalem, who flourished in the latter half of the 1st century B. C. He is distinguished from other rabbis of the same name by the surname of Hazzaken (the Elder). He is also called the Babylonian from his native country. Admired for his humanity, mildness, and love of peace, he is also celebrated as the reformer and great propagator of the study of the traditional law, the results of which were afterward collected under the title of *Mishna* by one of his descendants and successors in the presidency of the sanhedrim, Rabbi Jehudah the Holy. Hillel's school flourished especially during the reign of Herod the Great, the rival school being that of the austere Shammai. Beside the legal decisions of Hillel, various sayings of his are preserved in the *Mishna*, as well as numerous anecdotes in the *Gemara*, all of which express his love of men, as well as of study. It is he who, being applied to by a pagan for instruction in the Mosaic law, replied: "'Do not to others what you do not like others to do to you,' is the essence; every thing else is but comment."—Another Hillel, who flourished about the middle of the 4th century, was the author of the existing Jewish calendar.

HILLER, FERDINAND, a German composer and pianist, born in Frankfort-on-the-Main, of Jewish parents, Oct. 24, 1811. At the age of 10 he made his appearance in public as a pianist, and soon after became the pupil of Hummel. In 1829 he went to Paris, where during a residence of 7 years he acquired a considerable reputation as a composer and pianist. The next few years of his life were passed alternately in Italy and Germany, where he produced his operas *Romilde*, *Die Zerstörung Jerusalems*, *Der Traum in der Christnacht*, and *Konradin, der letzte Hohenstaufe*. In 1847 he became musical director at Düsseldorf, and 3 years later chapelmaster at Cologne, where he founded the Rhenish conservatory. He after-

ward gave concerts in London and Paris, having directed the Italian opera in the latter city during the season of 1851-2, and produced there a symphony entitled *Es muss doch Frühling werden*. His works are numerous, and embrace a wide range. He ranks among the first living pianoforte composers.

HILLHOUSE, JAMES, LL.D., a U. S. senator from Connecticut, born in Montville, Oct. 21, 1754, died in New Haven, Dec. 29, 1832. He was graduated at Yale college in 1773, of which institution he was treasurer from 1782 for about 50 years. He studied law, and took an active part in the struggle of the revolution; was a member of congress in 1791, and in 1794 was chosen a member of the U. S. senate, where he remained for 16 years. Resigning his seat in 1810, he was appointed commissioner of the school fund of Connecticut, and continued to act as such for 15 years.—JAMES ABRAHAM, an American poet, son of the preceding, born in New Haven, Sept. 26, 1789, died at his residence near New Haven, Jan. 4, 1841. He was graduated at Yale college in 1808. In 1812 he delivered before the Phi Beta Kappa society at New Haven a poem entitled "The Judgment, a Vision," descriptive of the scenes of the last day, which was immediately published (New York, 1812), and was commended by both American and English critics. He engaged in commerce in New York; in 1819 he visited England, and published in London his drama of "Percy's Masque," which was reprinted in New York with changes in 1820. In 1822 he removed to a country seat near New Haven, where he passed the remainder of his life. In 1825 he published his second drama, "Hadad;" and in 1839 a collected edition of his writings appeared in Boston, under the title of "Dramas, Discourses, and other Pieces." It included, beside several polished prose compositions, "Demetria," a domestic Italian tragedy, which he had written in 1813.

HILLIARD, HENRY WASHINGTON, an American lawyer, politician, and scholar, born in Cumberland co., N. C., Aug. 8, 1808. During his childhood his father removed to Columbia, S. C. He was graduated at the South Carolina college at the age of 18, and began the study of law at Columbia, but soon afterward removed to Athens, Ga. In 1829 he was admitted to the bar, and practised his profession in Athens for 2 years. In 1831 he was elected to a professorship in the university of Alabama, which he held for 3 years. In 1838 he was elected to the legislature from Montgomery co. He was a member of the whig national convention at Harrisburg in 1840, where he zealously advocated the nomination of Mr. Clay. In 1841 he was nominated for congress, but as the election that year was under the "general ticket system," he was defeated, though he received a large majority in his own district. In 1842 he was sent as chargé d'affaires to Belgium, where he remained 2 years. In 1845 he was elected to congress, and was successively reelected un-

til 1851, when he declined being again a candidate. His first speech in congress was in favor of giving notice to England of our wish to discontinue the joint occupancy of Oregon. In 1846 he voted for the *ad valorem* tariff, separating on that question from the great body of his whig friends. In common with the other representatives from the southern states, he opposed the Wilmot proviso, and he was a prominent advocate of the compromise measures of 1850. In 1856 he was a candidate on the Fillmore electoral ticket of Alabama, and in 1857 he was solicited to become the American candidate for congress; but he published a letter declining the nomination, and announcing his purpose to act with the democratic party. In 1855 a volume of his speeches was published in New York.

HILLIARD, NICHOLAS, an English miniature painter, born in Exeter in 1547, died in 1619. He was by profession a jeweller; but having a taste for painting, he studied the works of Holbein, and became noted for his miniatures. He painted Mary, queen of Scots, Elizabeth several times, James I., and other eminent persons.

HILLSBOROUGH. I. A S. co. of N. H., bordering on Mass., intersected in its E. part by the Merrimack river, and drained in the W. by the Contoocook; area, 960 sq. m.; pop. in 1850, 57,478. It has a gently diversified surface, but has few hills of great elevation. The soil is fertile and well watered with running streams and small lakes. The productions in 1850 were 205,634 bushels of Indian corn, 110,571 of oats, 340,719 of potatoes, 76,350 tons of hay, and 1,014,774 lbs. of butter. There were 16 cotton mills, 8 woollen factories, 13 machine shops, 18 grist mills, 96 saw and planing mills, 2 paper mills, 23 tanneries, 84 churches, 10 newspaper offices, and 12,733 pupils attending public schools. The county is traversed by the Concord, Contoocook valley, New Hampshire central, Wilton, and Peterborough and Shirley railroads. Capitals, Amherst, Manchester, and Nashua. II. A W. co. of the peninsula of Florida, bordering on the gulf of Mexico; area, about 1,000 sq. m.; pop. in 1850, 2,377, of whom 660 were slaves. Its coast is deeply indented by Tampa bay, and it is drained by Hillsborough, Alafia, and Manatee rivers. Its surface is low, level, and in some places marshy, and is timbered with live oak and palmetto. The soil is very rich. The productions in 1850 were 16,263 bushels of Indian corn, 26,256 of sweet potatoes, 5,575 lbs. of rice, 24,250 gallons of molasses, and 18 bales of cotton. There were 2 saw mills, 4 churches, and 120 pupils attending public schools.

HILLSDALE, a S. co. of Mich., bounded S. by Ohio, and touching the N. E. extremity of Indiana; area 555 sq. m.; pop. in 1850, 16,159. It is drained by the head waters of St. Joseph's river of Lake Michigan, St. Joseph's of the Maumee, the Kalamazoo, and Grand river. It has an undulating surface, heavily timbered in the S. and supporting elsewhere a thin growth of oak and hickory. The soil is a rich sandy

loam. The productions in 1850 were 216,126 bushels of wheat, 247,520 of Indian corn, 136,127 of oats, 108,102 of potatoes, 12,557 tons of hay, and 82,095 lbs. of wool. There were 8 grist mills, 24 saw mills, 2 iron founderies, 4 newspaper offices, 2 churches, and 5,628 pupils attending public schools. Iron ore and fine sandstone are found in the county. It is intersected by the Michigan southern and northern Indiana railroad. Capital, Hillsdale.

HILLSDALE COLLEGE, an institution of learning in Hillsdale, Mich., under the patronage of the Freewill Baptists. It was originally established at Spring Arbor by a vote of the Michigan yearly meeting in 1844, and was chartered as a college in the following year. In 1850 it was removed to Hillsdale. The college is open to both sexes, which may pursue the same course of study, though an optional and partially distinct course is arranged for females. The faculty consists of the president, 5 professors, and 2 tutors. The number of students in 1859 was 44, of whom 3 were females. Connected with the college is a preparatory department, having in that year 713 students, of whom 270 were females. The college has \$60,000 invested in buildings, and an endowment secured of \$100,000. Its first president was the Rev. D. M. Graham, who held the office from 1844 to 1848. He was succeeded by the present incumbent, E. B. Fairfield, LL.D.

HILTON, WILLIAM, an English painter, born at Lincoln, June 3, 1786, died Dec. 30, 1839. He studied at the royal academy, and early devoted himself to historical painting, in which he displayed a complete mastery of the human figure, and singularly graceful composition. In his choice of subjects, many of which are from classic mythology, he evinced true poetic feeling. One of his best works is "Una and the Lion entering the Cave of Corceca," which has been engraved. He was a royal academician, and succeeded Fuseli as keeper of the academy.

HIMALAYA MOUNTAINS (Sanskrit, *hema*, snow, and *alaya*, place of), a chain of mountains bordering on Hindostan on the N., and separating it from Thibet. Little was known of the Himalaya, nor was it supposed that its summits rivalled those of the Andes in elevation, until in 1802 the observations of Col. Crawford, who had resided for some time in Nepal, were made public. Expeditions were soon set on foot to explore the central portions of the range, and these established its preëminence in the height of its peaks over all the other mountains of the world. The range is an almost unbroken barrier, 150 m. in width, extending 1,440 m. from the great bend of the Brahmapootra in lat. 28° N., long. 95° E., to the break in the valley of Cashmere, through which the river Sind or Indus flows on its way to the Arabian sea, in lat. 35° N., long. 73° E. In the first half of its western course the chain makes but 2° northing; it then bends N. W., making the other 5° of latitude in about as many of longitude. Across the Indus

the Hindoo Koosh is the extension of the same mountain group; and in the other direction, on the further side of the Brahmapootra, the range under other names spreads out in the country of Bootan and Assam, and extends toward the Chinese sea. The map of Hindostan exhibits a remarkable peculiarity in the structure of these mountains. Unlike other ranges, which send off at a greater or less angle with themselves the waters they divide, these admit along their N. slopes great streams to flow parallel with their own course. Commencing near the central point of the range, they follow it in nearly opposite directions. The one called the Sanpoo (the main branch of the Brahmapootra) flows 700 m. eastwardly, till in Bootan, where the mountains flatten away, it passes around them, uniting its waters with the vast floods poured out by the Ganges, that are gathered by its branches from the S. slopes of the same ranges which on their N. side fed the Sanpoo. So the Indus starting from the same source flows N. W. along the enclosed valley of the N. E. slope, and finds a passage through at last into the valley of Cashmere, between which and the Arabian sea it receives as branches the great rivers whose sources are just across the mountains from those of the main stream. One of these branches, the Sutlej, also heads on the N. side near the source of the Indus, but more among the mountains; and this too passes N. W. 188 m. through a country of awful sublimity, till it finds a gap by which it crosses the range. Thus the map indicates an increasing elevation from each extremity to the portion midway along the group; also high lands in Thibet, which forbid the spread of the rivers toward the N. E.; and again a parallel system of elevations which direct the waters along longitudinal valleys. It also points out the rapid descent which the streams must make on the southern slopes, reaching as they do, in a comparatively short distance, the country of plains entered by the northern branches after circuits of nearly 1,000 miles. The plains of India at the E. extremity of the Himalaya are but little elevated above the level of the sea; at the foot of the mountains they may be 350 feet above this level in the meridian of Calcutta, and in the Punjaub toward the W. extremity of the range the elevation may be 1,000 feet. From these plains the view of the mountains is for the greater part of the time obscured by the vapors falling upon the southern ridges; but after the cessation of the S. E. monsoons the snowy peaks are sometimes seen at a distance of about 200 m., at an angle of elevation of only about 1° above a horizontal line. On approaching nearer to the chain, the distant peaks are lost to view behind the nearer wooded ones, and glimpses are rarely obtained that impress one with the vast magnitude and stupendous height of the chain. Dr. Joseph D. Hooker, author of "Himalayan Journals," distinguishes 4 parallel longitudinal belts of country in the structure of these mountains. The lowest on the S. side extends from the plains

of India to regions where snow is met with in winter. It is from 40 to 60 m. in width, ranging it may be from 5,000 to 8,000 feet mean elevation, with peaks 13,000 to 14,000 feet high. The lower portions are tropical, the upper temperate. It is cut up by ravines, but is not particularly precipitous. Beyond this ranges the 2d or snowy belt, that of the highest peaks, 30 to 40 m. broad, its surface rugged and precipitous, with summits rising frequently to 20,000, some to 25,000, and a few even to 28,000 feet above the level of the sea. Some of the rivers flow in deep gorges across this belt, their beds not more than 3,000 feet above the sea level. The mean elevation is probably under 13,000 feet. To this succeeds the central belt or axis of the chain, from 10 to 20 m. broad, its mean elevation perhaps 15,000 feet, and the main ridge or water-shed seldom below 17,000 feet except at the extremities; the surface is rocky and often precipitous. The northern belt is a region of mountains and valleys little explored, constituting the slope toward Thibet. Its climate is temperate, but of excessive vicissitudes, subject to drought, and the hills lack the luxuriant forest growth which covers those of corresponding elevations upon the other side. Other writers speak of a belt of alluvial hills bordering the plains of Hindostan, and N. of them a tract called the *Terræ* or *Terreeana*, 10 to 30 m. wide and 1,000 feet above the level of the sea, covered with dense pestilential jungle, and extending along the foot of rocky ridges of 5,000 to 6,000 feet elevation. Between these and the higher ranges are found the cultivated valleys of Nepal, Sikkim, Bootan, and Assam, containing picturesque and populous towns and villages. Behind these are the forest-clad mountains, and still further back the snowy range. Bishop Heber describes this humid malarious forest tract, called the *Terræ*, skirting the southern foot of the Himalaya, as a long, black, level line, appearing as though it might have been drawn with ink and a ruler. It gradually narrows away as it gains in height toward the central portion of the chain, and disappears to the W. of the Sutlej. Back of this tract Dr. Hooker states that "the mountains rise more or less suddenly, though seldom in precipices." They are reached sometimes by difficult paths that follow up the narrow and pestilential gorges of the rivers, or more commonly by the roads that ascend into the healthier atmosphere upon the summits of the secondary ridges. These ridges present to the traveller toward the axis of the chain a succession of ascents and descents; in each valley his progress is interrupted by a stream tributary to the nearest river to the right or left, or by the deep gorges of the larger branches themselves; and upon the slopes his course is impeded by forests and rocky precipices. No plain anywhere opens out before him; and during the warmer portion of the year cloud and fog shut in the view from the commanding points he reaches. So rugged are the mountains that 12 or 14 days are usually required

for the journey of about 100 m. to the axis of the chain upon the main routes from India to Thibet. The parade ground of the old military post of Sabathoo, in the region of the Sutlej, $\frac{1}{2}$ m. long and $\frac{1}{2}$ m. wide, was said to be the only level spot between it and the Tartar frontier on the N. or the valley of Nepal on the E. While the mountains thus oppose their ruggedness and meteorological conditions to investigations of their peculiar features, they offer no inducements, in rich mines of silver, gold, or precious stones, to tempt their exploration, and establish settlements under their snowy peaks; nor do they present fertile tracts upon steppes of different elevations inviting cultivation, with the offer in convenient proximity of the fruits of temperate and tropical climes. Hence it is not strange that occasional travellers, in their attempts to define the forms of masses so vast with contour so irregular, disagree in their accounts, and fail to convey clear ideas of the topography of the different portions. By most of them the secondary ridges on the S. side, particularly of the E. portion of the chain, are represented as spurs leaving this at right angles, though as seen from the plains at a distance they present the appearance of longitudinal ridges. The strike of the rocky formations of which the chain is composed—the metamorphic slates and granitic rocks of the central portion, and the silurian sandstone of the southern ridges—is described as everywhere with the general course of the mountains, thus suggesting a resemblance of the system to that of the Appalachians of the United States in its parallel ridges and valleys, though this feature on the S. side of the Indian mountains may be obscured by the effect of rapid and excessive drainage.—The statements as to the relative amount and duration of the snow upon the N. and S. slopes of the chain have led to much controversy. The authorities generally concur in representing that milder temperatures prevail upon the N. side than at corresponding heights on the opposite side. The two Gerards make the line of perpetual snow on the S. side at 12,981 feet, and on the N. 16,620. Lieut. Strachey, extending his observations over a district between long. 77° and 81° , where heights covered with perpetual snow are found over a belt of 35 m. in width between lat. 30° and 32° , concluded that the snow line on the Thibetan side is 18,500 feet above the sea, and on the Indian side 15,500. On the S. slope grain is cultivated with difficulty at 10,000 feet, while on the other side good crops are raised at 16,000 feet. It grows even at 18,544 feet, as seen by Capt. Gerard. This is more than 1,200 feet higher than the snow line in the equatorial Andes. The belt constituting the water-shed is described as excessively cold, bleak, and dreary, but in great part free from snow. This is no doubt owing to the rain clouds being deprived of their moisture as they are swept from the bay of Bengal over the secondary ridges, upon which it is in part precipitated in rain and

the remainder in snow upon the higher peaks. But the cause of the milder temperature is not so obvious. The highest peaks are not found along the most elevated portion of the range, but for the most part they are to the S. of it, rising in scattered groups from the secondary ridges. Of several of these groups to the E. of Sikkim little is known, except that as seen from a distance they appear to reach heights of 23,000 to 25,000 feet, or perhaps more. North of Sikkim is a noted group of immense peaks, among which stands preëminent Kintseindjunga, 28,156 feet (Petermann), or Kinchinjunga, 28,178 feet (Hooker), in lat. $27^{\circ} 42'$, long. $88^{\circ} 11'$; and one degree further east Tschumalari, 23,946 (P.), or Chumulari, 23,929 feet (H.). Upon the same parallel stands, in long. $85^{\circ} 58'$, the peak recently ascertained by Col. Waugh to be the highest ever yet surveyed, 29,002 feet, and named by him Mt. Everest in honor of the preceding surveyor-general of India. In the Nepalese its name is Gorishanka; by the people of Tibet it is called Chingomamara. Mr. Hodgson had incorrectly given to it the name Deodunga or Deodhunga, which was that of a peak near by of only 8,000 feet elevation. Dhualagiri or Dhawalagiri, in lat. $28^{\circ} 42'$, long. $83^{\circ} 32'$, formerly estimated at 28,000 feet, is rated by Col. Waugh at 26,826. From the W. extremity of Nepal to the passage of the Indus through the chain, no fewer than 50 peaks are enumerated, the heights of which range between 19,500 and 25,749 feet, which latter is the height of Nanda Devi in Kumaon, drawn by Heber as a snowy spire, its sides sloping at an angle of 70° with the horizon, and rising far above the similarly snow-clad summits around. Every 12th year the natives make a pilgrimage to this mountain, and the few who succeed in reaching the spot hold a religious festival at a point a mile below the inaccessible summit. The mean height of the central portion along the western Himalaya is estimated at 20,000 feet; and the passes sometimes cross at heights of 18,000 to 19,000 feet.—The lakes occurring in the Himalaya are few in number, and not of very great extent; the only important ones are on the N. side of the axis, and are the sources of the branches of the Indus, Sutlej, and Sanpoo. Some of these are salt. The largest are from 20 to 30 m. in length. The Wullur lake in Cashmere, 5,000 feet above the sea, is a sheet of water 21 m. long E. and W., and 9 broad, formed by the spreading out of the river Jhylum, the only instance on the whole range of a river thus expanding into a lake. The rivers are fed during the summer by copious rains brought up by the S. E. monsoons, which sweep over the bay of Bengal, and, reaching the eastern Himalaya in April, gradually progress westward. The whole S. side of the chain by midsummer is enveloped in clouds and mists. In September they begin to clear off in the western divisions, but in the eastern the rains are not over till October or November. In the winter an upper

current of S. W. winds brings new supplies of moisture, which falls in snow upon the higher mountains, and there is in the more humid provinces a short rainy season about the close of the year. The outer ranges receive the most of the rain. Dr. Hooker estimates the fall in Sikkim to amount to 120 inches in the year at 7,000 feet elevation, and to gradually decrease to 10 inches at 19,000 feet. The rivers flowing S. are thus much larger and more numerous than those upon the N. side of the chain. In their upper portions their descent is comparatively gentle, but further down they run with great rapidity, and generally in deep and almost inaccessible ravines; yet they rarely form cascades of any grandeur. Fish of the carp kind abound in them from the plains to 15,000 feet elevation, except at heights between 5,000 and 10,000 feet. Those of eastern Tibet especially swarm with fish at elevations from 10,000 to 14,000 feet. Glaciers are numerous in the more elevated portions of the mountains, but are wasted away before they reach the lower valleys. Deposits of bowlders and extensive moraines, found in all the valleys at heights exceeding 8,000 or 9,000 feet, indicate that the glaciers formerly reached 6,000 feet below their present limits. Volcanoes are entirely wanting throughout the range, and there are no evidences of extinct ones. Hot springs are frequently met with at heights from 10,000 to 18,000 feet, their temperature ranging from 100° to 130° F.—The geological formations through the most elevated portions of the range are principally metamorphic slates alternating with granitic belts. They form the loftiest peaks; and against them rest strata of the silurian period. The formations range with the chain, and are seen usually dipping toward its axis. In Kumaon rocks of the oolitic formation succeed to the silurian, and in some of the larger river valleys at elevations of 15,000 feet are found tertiary beds with fossils referring them to the miocene period. Among them are specimens of extinct species of the horse, rhinoceros, elephant, hippopotamus, &c. Fresh water pleistocene deposits have been found by Dr. Thomson in the extreme western Himalaya of Tibet, on the flanks of mountains far above the present level of the rivers and lakes. The mineral productions are of little importance. Gold is found in eastern Tibet, but the Chinese government prevents its being worked to much extent. In Koonawur, a district at the passage of the Sutlej through the chain, are mines of specular iron ore, which have been long worked by horizontal excavations, extending sometimes half a mile into the mountains. The ore is converted into wrought iron by the natives, who make of it sabres, knives, and hatchets, the best metal being known as that of the locality called Sheel. Copper ores too are found here, and also in Nepal and Sikkim; but they are not worked.—The vegetable productions in the lower portions of the mountains are those of the tropics. They

reach up to the height of 6,000 or 7,000 feet in the humid central portions of the range, and in the extreme western to 3,000 or 4,000 feet. In the deep gorges of the rivers are plantains, palms, and fig trees; above are magnolias and laurels; to these succeed oaks, chestnuts, birches, &c.; still higher are pine forests, then rhododendra and the scanty alpine growth. All these products of the colder portions are recognized as European forms. These indeed begin to appear as the tropical plants give way to those of temperate climes; and at heights from 6,000 to 12,000 feet are seen species of oak, maple, ash, cherry, poplar, hornbeam, juniper, willow, pines, and many other of familiar names, some of which are identical with the species of Europe and America. The grains, garden fruits, and vegetables cultivated in the upper portions of the mountains are very similar to those of northern Europe. In the state of Bussaher, of which Koonawur is a province, grapes are extensively cultivated, and tea is produced as an article of commerce. The distribution of the fauna is similar to that of the flora: tropical forms in the lower regions, among which are found tigers, leopards, buffaloes, the rhinoceros, elephants, &c.; in the upper districts European types predominate, mixed with Chinese and Japanese forms to the eastward, and partaking in the alpine districts of the Siberian character.—The inhabitants constitute many tribes and nations, of the Mongolian race. Those of all the valleys above 8,000 feet elevation are Thibetans, in whom the Indo-European is more or less intermixed with the Mongolian. A recent English writer on the inhabitants of the villages in the Himalayas says: "The difference which generally exists between the inhabitants of the plains and those of the mountains is perhaps nowhere so manifest as in India; and the contrast becomes more and more decided the nearer one approaches the snow-capped peaks of the Himalayas. From a dark bronze color, the complexion of the inhabitants becomes almost fair, while the people are more active but less graceful in their movements. The hill tribes are moreover more moral and sincere than the people of the plains, and in disposition are not unlike the Europeans of the north. This affinity can only be accounted for by the similarity of climate, for the Indian mountaineers have less communication with Europeans than those who inhabit the plains. The same cause which covers their mountain land with stately pine trees influences them in their dress, which consists of thick garments, while those worn in the valleys are made of the lightest materials. Their houses are not unlike those of the Swiss, being built of wood, and indeed many of them have all the appearance of *chalets*. Those tribes who live nearest the region of perpetual snow are afflicted with goitre. The hill men are strongly attached to their mountain homes, and do not willingly quit them for any considerable time." The English have established many stations at points situated from 6,000 to 8,000 feet above the sea, where

they find a healthy atmosphere and a climate like that of England; and they anticipate the time when the habitable portions of the Himalayas will be peopled by their own colonists and their descendants. Dr. Hooker names the following as the most important of these hill sanatoria, as he calls them: Darjeeling, elevation 7,000 to 8,000 feet, in Sikkim; Nainital, 6,000 to 7,000 feet, and Almora, 5,000 to 6,000 feet, in Kumaon; Masuri, 6,000 to 7,000 feet, in Gurwhal; Simla, 7,000 to 8,000 feet, in Sirmore; Kangra, 7,000 to 8,000 feet, in the Beas valley; and Murree, 7,000 to 8,000 feet, between the Indus and Jhylum.—The most recent explorers of the Himalayas are Adolf Schlagintweit, who was murdered in Aug. 1857, while engaged in his investigations, and his brothers Hermann and Robert. From a map drawn up in May, 1859, and presented by them to the French geographical society, it appears that, in accordance with Alexander von Humboldt's map of the mountain chains and volcanoes of central Asia (1843), but contrary to the opinion of Dr. Thomson and other later geographers, there is not the least connection between the Kuen-lun and Karakorum branches of the Himalayas, each of them being an independent chain.—The most important works relating to the Himalayas are the "Himalayan Journals," before referred to, by Dr. J. D. Hooker, who resided at Sikkim; Hodgson's papers in the "Asiatic Researches," in which are detailed accounts of the inhabitants and the zoology of the mountains; numerous other papers in the same work and in the "Asiatic Journal;" Bishop Heber's "Journal;" H. Strachey's "Physical Geography of W. Thibet;" Fraser's "Journal of a Tour through Part of the Snowy Range of the Himalayas," &c.

HIMERA, an ancient Greek city of northern Sicily, at the mouth of the river Himera, between Panormus and Cephalædium. It is said to have been founded about the middle of the 7th century B. C. by a colony from Zancle. It was once subject to the tyrant Phalaris, and at another time was a city of refuge for the Zanclean tyrant Scythes. Subsequently, however, it came to have a despot of its own, named Terillus, who, being expelled, applied to the Carthaginians for assistance, which was the immediate occasion of the first great expedition of that people to Sicily. This event took place in 480 B. C. The army of the Carthaginians, said to have been 300,000 strong, commanded by Hamilcar, was defeated at Himera with great slaughter by Gelon of Syracuse. This victory did not however restore liberty to the Himereans, but merely transferred them from the tyranny of Terillus to that of Thrasydæus, the son of Theron of Agrigentum, under whom such numbers of the citizens were executed or banished that ere long the city had to be repopled with new colonists, who, being mostly of the Dorian race, rendered it thenceforward a Doric city. After the death of his father, Thrasydæus was expelled, and then the citizens whom he had driven into exile were allowed to

return. In 408 B. C. the second great expedition of the Carthaginians to Sicily took place, under Hannibal the son of Gisco and grandson of Hamilcar, to whom after a desperate resistance the city succumbed. The greater part of the inhabitants were put to the sword, 3,000 of those who had been taken prisoners were sacrificed by Hannibal to the manes of his grandfather Hamilcar, who had fallen in the great battle above alluded to, while the city itself was utterly destroyed. Himera was never rebuilt, but such of its inhabitants as survived its destruction fled to the neighboring town of Therma, to which they gave the name of Himera.

HIMILCO, the name of several distinguished Carthaginians, the most eminent of whom were the following: I. The navigator, who lived in the 5th century B. C., and who was sent on a voyage of discovery northward from Gades at the same time that Hanno was commissioned to explore and colonize the W. coast of Africa. On his return he is said to have reported that the stagnant nature of the sea, the vast mass of seaweed that floated on its surface, and the absence of wind, had prevented his progress toward the north. II. A general who commanded, in conjunction with Hannibal the son of Gisco, the expedition sent by the Carthaginians to Sicily in 408 B. C. The latter having been carried off by sickness soon after its arrival, Himilco succeeded to the command. Having reduced Agrigentum, destroyed several of the Greek cities, and added considerably to the Sicilian possessions of Carthage, he concluded an advantageous peace with Dionysius the Elder, tyrant of Syracuse, and returned to Africa. Subsequently, when Dionysius declared war against Carthage, and attacked her dominions in Sicily, Himilco was appointed to defend them. Being worsted, he retired from Sicily, but in the following spring returned with a powerful force, and after recovering the greater part of the lost territory advanced against Syracuse. This enterprise, however, proved unsuccessful, and Himilco, having concluded an ignominious peace, returned to Carthage, where, overwhelmed with obloquy, he presently committed suicide by starvation.

HIMMEL, FRIEDRICH HEINRICH, a German composer, born in Trenenbrietzen, Prussia, Nov. 20, 1765, died in Berlin, June 8, 1814. He early attracted the notice of Frederic William II., who afforded him the means to pursue his musical studies, and afterward appointed him royal chapelmaster. His chief opera was his *Semiramide*, first performed in Naples in 1795. This work was said to contain the material of 10 ordinary operas. Himmel composed many cantatas and occasional pieces, and an immense number of pianoforte compositions, songs, and instrumental pieces.

HINCKELDEY, KARL LUDWIG FRIEDRICH VOX, a Prussian minister of police, born near Meiningen in 1803, killed in a duel, March 10, 1856. He studied law, entered the public service at an early age, was appointed president

of police in 1848, introduced many reforms in the police system, and founded many new beneficent institutions in Berlin, one of which for poor citizens, established in 1852, bears his name (*Hinckeldeystiftung*). In 1853 he became general director of police, and in 1855 he was also intrusted with that department in the ministry of the interior. In consequence of his suppression of the jockey club in 1855 he was involved in a duel with a young nobleman named Rochow-Plessow, by which he lost his life. This affair gave rise to an angry feeling between the Prussian bureaucracy and some of the most influential members of the nobility. A monument was erected to him in 1857 upon the spot near Charlottenburg (the *Jungfernhäide*) where he was killed.

HIND, JOHN RUSSELL, an English astronomer, born in Nottingham, May 12, 1823. He was educated for a tradesman, but, full of enthusiasm for the study of astronomy, he took a dislike to trade, and in 1840 entered the office of a civil engineer in London. Through the influence of Prof. Wheatstone, he obtained a situation the same year in the royal observatory at Greenwich, where he remained about 4 years. After a short stay in Ireland, where he was sent on the commission to determine the exact longitude of Valencia, Mr. Hind was appointed, at the recommendation of Prof. Airy, the astronomer royal, to a post in the observatory of Mr. Bishop, in Regent's park, London. He began here in 1845 a series of observations, during the course of which he calculated the orbits and declinations of more than 70 planets and comets, noted 16 new movable stars and 3 nebulae, and discovered 10 new planets. In July, 1846, he discovered a comet, which had been observed by De Vico two hours before at Rome; and early in 1847 another comet, which at its perihelion passage, March 24, was bright enough to be seen in the strong morning twilight. In April, 1848, he made a very remarkable discovery of a new reddish yellow variable star of the 5th magnitude in Ophiuchus. In 1850 this star was only of the 11th magnitude, and it was calculated that it would soon disappear altogether. The planets discovered by Mr. Hind are as follows: Iris, Aug. 13, 1847; Flora, Oct. 18, 1847; Victoria, Sept. 13, 1850; Irene, May 19, 1851; Melpomene, June 24, 1852; Fortuna, Aug. 22, 1852; Calliope, Nov. 16, 1852; Thalia, Dec. 15, 1852; Enterpe, Nov. 8, 1853; Urania, July 22, 1854. In Dec. 1844, Mr. Hind was elected a member of the astronomical society of London, and was afterward appointed foreign secretary to the society. In 1846 he was named foreign secretary to the philomathic society of Paris, and in the following year a corresponding member. He obtained in 1851 from the academy of sciences of Paris the medal of Lalande, and in the same year became a corresponding member of that society. In 1852 the astronomical society of London awarded to him their royal medal, and at the same time the

British government gave him a pension of £200. Mr. Hind is the director of the "Nautical Almanac" of England. His writings have generally been published in the "Transactions" of the royal astronomical society of London, in the *Astronomische Nachrichten* of Altona, and in the *Comptes rendus* of the academy of sciences of Paris. He is also the author of "An Astronomical Vocabulary" (1852); "The Comets" (1852); "The Solar System, a Descriptive Treatise upon the Sun, Moon, and Planets, including an Account of all the Recent Discoveries" (1852); "Illustrated London Astronomy, for the Use of Schools and Students" (1853).

HINDOO KOOSII, the Indian Caucasus of the ancients, a chain of mountains on the N. boundary of Hindostan, separating the province of Cabool from Balkh and Buduckshan. It continues the range of the Himalaya from the passage of the Indus through the chain in long. 74°, and terminates on the W. at the Bamian pass, 80 m. N. of the city of Cabool, near the great peak Hindoo Koosh, in long. 68° 50'. The extension of the range further west is called the Huzareh mountains. The mountains as seen from the plains on the S. appear to rise by 4 distinct ranges, one behind another; and the highest of these is lost in a succession of high lands, which spread out in the countries to the N. The elevation of the chain is in many places over 20,000 feet. The upper portions are bare of vegetation, and the mountains generally resemble the Himalaya. From Cabool 6 passes cross the range to the plains of Turkistan. Though the highest points reached by these may not exceed 13,000 feet, the routes are exceedingly rough and difficult. The principal rivers that rise in these mountains are the Oxus or Jihoon and the Helmund.

HINDOSTAN, or **HINDOSTAN** (Persian, *Hindu*, blacks, and *stan*, land, "land of the blacks," or "Negroland"), the richest and most celebrated country of Asia, and the most important foreign possession of the British empire. It is bounded N. by the Himalaya mountains, which separate it from Thibet and Chinese Tartary; E. by Arracan and Cassay, from which it is partially separated by the river Brahmapootra; S. E., S., and S. W. by the bay of Bengal and the Indian ocean; and W. by the river Indus. It lies nearly between lat. 8° and 35° N. and long. 66° and 99° E. The S. half of the country forms one of the largest peninsulas in the world. The extreme length of Hindostan from N. to S. is about 1,800 m., and its extreme breadth from E. to W. 1,500 m. Its coast line is about 3,200 m., of which 1,900 are on the Indian ocean and 1,300 on the bay of Bengal. The area is about 1,364,000 sq. m., and the total population is estimated at 174,000,000. Hindostan naturally forms 7 great geographical divisions: 1. The Himalaya mountains, fully treated under their own title. 2. The plain of the Indus, comprising the Punjab or "country of the 5 rivers," viz.: the rivers Sutlej, Beas or Beeah, Ravee, Chenab, and

Jhylum or Behut. That part of the plain which is S. of the Punjab is a great sandy desert, known as the Thurr, or the desert of Sinde. 3. Sinde, or the country on both sides of the Indus, extending from the sea nearly to the confluence of the Chenab. 4. The plain of the Ganges, comprising the most fertile, best cultivated, and most thickly inhabited portion of Hindostan. It is naturally divided into the plain of Bengal, the plain of Bahar, and the plain of the Doab, Oude, and Rohilcund. This region contains more than half the population of Hindostan, and most of the principal cities, including Calcutta, the chief seat of government. 5. The mountain region of northern Hindostan, a large tract nearly in the form of a triangle, with its base among the Vindhya mountains on the S. and its apex near Delhi on the N. The S. part of this region forms the extensive table-land of Malwah, whose S. boundary is the Vindhya mountains, and whose height above the sea varies from 1,300 to 2,000 feet. It is occupied by a number of principalities ruled by native chiefs. On the W. side are Guzerat and Cutch. The N. W. part of the mountain region of northern Hindostan is called Rajpootana, because it belongs to the Rajpoot princes. It is a very extensive country, and is bounded N. by the Hill states, the Punjab, and Sinde, E. by Agra and Delhi, and S. by Guzerat and Malwah. It comprises the states of Alwur, Banswara, Bikaner, Doongerpore, Jessulmeer, Joodpoor or Marwar, Jeypoor, Jhallawar, Odeypoor or Mewar, Tonk, Serohee, Kerowlee, Kishenagur, Pertaubghur, Kotah, Boondee, and the city of Ajmeer, which with the territory around it belongs immediately to the British government. These states are nominally independent, but are under British protection, and their military forces are commanded by British officers. The most important of them are Joodpoor, Odeypoor, and Jeypoor. 6. The Deccan, a term originally applied to the whole peninsula of India S. of the Nerbudda river, but now restricted to the country extending from the Nerbudda on the N. to the Kistnah on the S., or from lat. 22° to 16° N. It consists chiefly of an elevated table-land enclosed by low plains extending to the sea shore. The highest elevation of this table-land is 2,500 feet above the level of the sea. The greater part of the Deccan is ruled by native princes under British protection. The centre of the northern portion is occupied by the territories of the nizam or rajah of Hyderabad, a Mohammedan prince, whose dominions were formerly called the kingdom of Golconda, from the city of that name, famous for its traffic in diamonds. East of Golconda are the possessions of the Hindoo rajah of Berar, sometimes called the rajah of Nagpoor. The rest of the Deccan, with inconsiderable exceptions, is subject directly to British rule. The narrow strip of coast which lies between the table-land of the Deccan and the Indian ocean is sometimes called the Malabar coast, but the name of Malabar properly belongs only to the southern part of

it, the northern part being called the Concan and the middle part Canara. The opposite coast of the peninsula, on the bay of Bengal, is called Coromandel. 7. Southern India, or India S. of the Kistnah river, is bounded E., W., and S. by the sea, and comprises the native states of Cochin, Travancore, and Mysore, and the territories directly under the British government of Madras.—For purposes of political administration under British rule, Hindostan is divided into three presidencies: Bengal, Madras, and Bombay. The presidency of Bengal comprises the country N. of the Nerbudda, extending from the bay of Bengal to beyond the Indus. Its area, including the native states within its jurisdiction, is about 1,000,000 sq. m., with a population of 130,000,000. The presidency of Madras comprises almost the whole of peninsular Hindostan, with an area of 184,000 sq. m., and a population of 28,000,000; the presidency of Bombay extends over the Malabar coast between Cambay and Goa, and includes Guzerat, Cutch, and Sind, with an area of 180,000 sq. m., and a population of 16,000,000. The presidency of Bengal is divided into 3 lieutenant-governorships and several commissionerships. The native states of Hindostan are, with the exception of the independent governments of Nepal and Bhotan in the N., intermixed and surrounded by the British possessions, and are all of them more or less subject to British control or interference. They may be divided into 5 classes, viz.: 1. Those states with which the British have treaties giving them the right to interfere in their internal affairs when thought necessary by the British authorities, and empowering them to claim protection from the British government. These are Berar, Travancore, Colapore, and Cochin. 2. Those which have treaties offensive and defensive with the British, to whom the right is conceded of assisting in the collection of the revenue. These are Hyderabad, Baroda, and Guzerat. 3. Tributary states acknowledging the sovereignty of the British crown, but whose rulers are supreme in their own territory. These are 25 in number, of which the largest are Indore, Odeypoor, Kotah, Bhopaul, Cutch, Rewah, Bikaner, and Jessulmeer. 4. Those with which the British have treaties of guaranty and protection, and of alliance offensive and defensive. These are Tonk, Seronge, Nimbera, Puttecala, Keytul, Daba, and a number of small Sikh states. With Gwalior or the dominions of Sindia the British have treaties which leave Sindia nominally independent. The French possess a small territory on the E. coast, with an area of 188 sq. m. and a population of 210,000; capital, Pondicherry. The Portuguese hold a territory on the W. or Malabar coast, with an area of about 1,000 sq. m. and a population of 350,000; capital, Goa.—Hindostan abounds in large and populous cities, some of which are of great antiquity and well built, with superb monuments of architecture in the Hindoo and Saracenic styles. The principal cities are Calcutta, the British capital,

Moorshedabad, Dacca, Patna, Benares, Allahabad, Cawnpore, Bareilly, Furruckabad, Lucknow, Fyzabad, Agra, Delhi, Lahore, Amritseer, Surat, Ahmedabad, Baroda, Oojein, Poonah, Hyderabad, Nagpoor, Bombay, and Madras, each of which contains upward of 100,000 inhabitants. The cities are usually composed of unburnt brick houses, and with a few exceptions the streets are narrow, dirty, and badly paved. In some cases handsome European towns have been built by the British for their own residence in the vicinity of large native cities.—The chief rivers of Hindostan and their respective lengths are: Indus, 1,700 m.; Ganges, 1,500; Brahmapootra, 1,400; Jumna, a tributary of the Ganges, 780; Sutlej, a branch of the Indus, 900; Jhyllum, a branch of the Indus, 900; Gunduck, a branch of the Ganges, 400; Godavery, 880; Kistnah, 700; Nerbudda, 700; Mahanuddy, 550; Caverry, 470; Taptee, 460. Hindostan, considering its great extent, is singularly deficient in lakes. In the province of Orissa is the Chilka lake, 35 m. long and 8 m. broad; and on the Coromandel coast is the Pulicat lake, 33 m. long and 11 m. broad. These, however, are salt, and are in fact little more than lagoons formed by the sea breaking over the low sandy shore. There are a few other lakes, but none of much size. Preëminent among the mountains of Hindostan are those of the mighty Himalaya range, the loftiest in the world. The other main ranges are, the Vindhya mountains, stretching across the centre of the country; the eastern Ghauts, whose highest elevation is 3,000 feet, stretching along the Coromandel coast; and the western Ghauts, which extend along the Malabar coast from Cape Comorin to the Surat river, with an elevation at the highest of 7,000 feet above the sea.—The interior of the peninsula of southern Hindostan is a high tableland, considerably broken in the centre, and bounded E. and W. by the Ghauts, between which mountains and the sea on both sides lies a low, narrow strip of land. Proceeding into northern Hindostan, the face of the country is broken by various mountain ridges and high tablelands, until we reach the provinces of Bengal, Oude, and Delhi, where the land is a vast and very flat plain. Still further N. rises the series of elevations which culminate in the eternal snows of the Himalaya. The prevalent soil of the most populous part of Hindostan, the great plain of the Ganges, is a rich, black, alluvial mould. In some parts of Bengal extensive tracts of clayey soil are found. In the Punjab a black, fertile soil prevails, which to the S. W. in Sind and Guzerat becomes sandy. On the table-land of Malwah the soil is a deep, rich, black mould. On the great northern table-land it is generally a fertile loam on a substratum of rock. On the Malabar coast a red clay soil is found. On the Coromandel coast the soil is mostly sandy from the sea to the foot of the Ghauts.—The climate of Hindostan in the region of the Himalaya mountains exhibits the utmost extreme of cold, the summits rising far

above the limits of perpetual snow, while in the valleys and on the plains at the base of the mountains the heat of summer is intense. In the hilly country immediately below the great range the winters are severe, while the summers glow with tropical fervor. On the tablelands of the centre and the south the climate is comparatively mild, the thermometer falling as low as the freezing point in winter; but on the great plains which contain the principal cities and the bulk of the population the heat during the greater part of the year is excessive, the thermometer frequently rising to 100° and 110° F. A marked influence is exercised on the climate and seasons of Hindostan by the winds called monsoons, which blow half the year from the S. W. and the other half from the N. E. The S. W. monsoon begins in the S. of Hindostan early in June, and in the N. somewhat later. It brings with it from the Indian ocean floods of rain, which continue to fall at intervals until the end of September. During this rainy season the fall of rain is in Bengal from 50 to 80 inches. The N. E. monsoon begins about the middle of October, and brings rain from the bay of Bengal, which falls in torrents on the Coromandel coast until the middle or end of December, during which period the opposite coast of the peninsula enjoys fair weather and northerly breezes. From December to June is the dry season, during which little rain falls.—Hindostan produces almost all the metallic ores, and also diamonds and precious stones. Gold is extracted by washing from the sands of the mountain streams which form the head waters of the Ganges, and in the rivers that flow from the Ghats. Its collection in Rohilcund gives employment to a particular caste of people. Copper is found in the provinces of Delhi and Ajmeer, and in the Carnatic. There are mines of iron in Lahore, Ajmeer, Mysore, Coimbatore, and Malabar, and iron ore is found abundantly in Cutch and in many other parts of the country. Lead, antimony, plumbago, sulphur, and alum are also found, and there are inexhaustible mines of coal, of which large quantities are dug in Burdwan of fine quality. Saltpetre is produced in Bengal and Bahar. Rock salt is found in large quantities in Lahore, and in Mysore salt is made from wells. Diamonds are found in the bed of the Kistnah and in the province of Gundwana, and there are diamond mines in the extreme south on the banks of the Pannair river, which have been worked for hundreds of years, and occasionally yield large diamonds. The ruby, beryl, topaz, chrysolite, garnet, and carnelian are also found, together with beautiful jaspers and agates.—Hindostan produces almost all the species of the vegetable kingdom. In the mountain region of the north are found the alpine plants and all the varieties of grain, fruits, and flowers known in Europe. The lower ranges of the Himalaya are covered with magnificent forests of pine, larch, fir, yew, cedar, oak, holly, alder, sycamore, beech, mulberry, and chestnut, and the acacia from whose gum is made

the catechu. Lower down grow ratans and bamboos, while the forests of the plains and of the mountains of the south abound in valuable trees, among which are the teak, unsurpassed for ship-building, the saul, sissou, and tooon, many species of palm, conspicuous among which are the cocoanut and betelnut, of which there are extensive plantations, and the sandal-wood, which is valuable for its perfume and the essential oil which it yields. The banian tree, famous for its prodigious growth, which never ceases, is also among the products of Hindostan. The soil is generally fertile where it is watered, and artificial irrigation is consequently much resorted to. Cultivation is laboriously though not very skillfully pursued by the natives, whose implements are of a rude kind, the plough of a primitive construction merely scratching the surface, which is afterward harrowed by the branch of a tree, to prepare it for the seed. Rotation of crops is unknown, and manure is little employed, as the bulk of the people use little or no animal food and keep scarcely any stock. The religious prejudices of the people also prevent them from using as manure the dung of cattle, which is considered holy and devoted to religious purposes. Rice is the staple grain throughout Hindostan, but in the high grounds wheat and barley are cultivated. Maize, millet, peas, beans, vetches, and many varieties of pulse and grain peculiar to the country, are also raised. Sugar is everywhere produced from the cane, which grows luxuriantly in the plain of the Ganges. Opium is largely produced in many parts of the country, but particularly in Bahar and Malwah. The cotton plant is indigenous all over Hindostan, and is very extensively cultivated. Flax and hemp are also largely grown. Silk is produced in great abundance on the banks of the Ganges, and indigo and tobacco are generally cultivated throughout the country. Pepper is produced in Malabar. Among the fruits of Hindostan may be named the apple, pear, peach, apricot, grape, currant, raspberry, blackberry, and strawberry, which grow in profusion in the elevated region of the north, and the mango, the date, the plantain, lime, orange, pomegranate, and pineapple, which abound in the warmer parts of the country.—Among the animals are the elephant, which is found wild in the forests, and is employed in a tame state in all parts of the country; the rhinoceros, the camel, and many species of deer: the lion, which is found only in the north; the tiger, which abounds in the jungles that line the great rivers, where he attains a size unequalled in other countries; the leopard, the panther, the bear, and the wild boar. Wolves, hyænas, jackals, foxes, hares, porcupines, and a great variety of monkeys also abound. Among the domestic animals are the buffalo, which also exists in a wild state, the yak or ox of Tartary, which is numerous among the Himalaya mountains, the ass, the Cashmere goat, and several other species of goat. The native horse of India is a small pony of little

value, the finest horses having been imported from the countries west of the Indus. The birds comprise 3 species of eagles, many kinds of vultures, falcons, and hawks, parrots of splendid plumage, herons, cranes, storks, swans, partridges, quails, wild ducks, wild peacocks, and all the common domestic fowls known in Europe and America. Of the reptiles, many species of snakes are venomous, prominent among them the dreaded cobra de capello, whose bite is fatal. The Russelian snake, the whip snake, and several species of water snakes, are reputed to be almost equally dangerous. Venomous scorpions also are very common. The rivers of Hindostan swarm with fish, which form a large part of the food of the people. Among them the mango is the most highly esteemed for the table. The bickly, the rohal, and the sable fish are also considered delicious, and the bumbalo when dried is an important article of commerce. Crocodiles are found in the rivers, and large sharks infest the mouths of the principal streams. The varieties of insects are innumerable, comprising mosquitoes in prodigious abundance, ants of very destructive kind, the silkworm, the kermes insect, and an insect which produces lac from which varnish is made. Swarms of locusts sometimes devastate great tracts of country.—The population of Hindostan is marked by the greatest diversities of appearance, manners, language, and religion. Bishop Heber says in his "Journal of Travels in India:" "It is a great mistake to suppose that all India is peopled by a single race, or that there is not as great a disparity between the inhabitants of Guzerat, Bengal, the Doab, and the Deccan, both in language, manners, and physiognomy, as between any 4 nations of Europe. The inhabitants of the presidencies of Madras and Bombay, and of the Deccan, are as different from the nations I have seen, and from each other, as the French and Portuguese from the Greeks, Germans, and Poles." The number of races and tribes is so great that a mere enumeration of them would occupy considerable space. Of the ruling race, the British, there are supposed to be, exclusive of soldiers, about 40,000 in the country. The main division of the native people is into Hindoos and Mohammedans. The Mohammedans are supposed to number 10,000,000 or 12,000,000, or about $\frac{1}{3}$ of the entire population. They are chiefly found in the plain of the Ganges, where for several centuries they held dominion as conquerors and masters of the country, until their power was overthrown by the English. They entered Hindostan in the 11th century from Afghanistan, and their numbers were swelled by successive invasions for several centuries afterward. Arabia, Persia, Afghanistan, and Tartary have all contributed to form the Mohammedan population, whose numbers were still further augmented by great masses of native converts. In character the Mohammedans of Hindostan are distinguished from the Hindoos, and especially from the Hindoos of Bengal, by

greater energy and frankness, by pride and arrogance, and by their luxurious and dissolute habits. They are warlike and fanatical, and do not submit with patience to the domination of their English conquerors. The Hindoos proper, on the contrary, are for the most part mild and effeminate in appearance, and timid and servile in disposition and manners, especially the Bengalese and the people of southern Hindostan. Some of the races of the northern parts of the country, however, are very different from these. Such are the Rajpoots, the Sikhs, and the Jants, who exhibit in their appearance, conversation, and habits of life, a grave, proud, and martial character, being accustomed universally to the use of arms and athletic exercises, and preferring military service to any other occupation. The general complexion of the people is dark brown, though many are as black as negroes, while the Parsees and people of Cashmere in the north are but little darker than the inhabitants of the south of Europe. The features of the people indicate that they belong to the Caucasian division of mankind. They have black and straight hair, and are usually well formed, graceful, and agile. The most important language of Hindostan is the ancient Sanscrit, which is now nowhere spoken, and exists only in books; and with this nearly all the living languages of the country have a relationship. The chief of these are: the Tamul, spoken in almost every part of the Deccan; the Malabar, spoken on the Malabar coast; the Canaree, extensively used in Canara and Mysore; the Mahratta, spoken by the Mahratta people; the Telinga, spoken in Orissa, in Golconda, and in the valley of the river Kistnah; the Bengalee, which is used at Calcutta and on the banks of the Ganges throughout Bengal; the Hindostanee, spoken also in Bengal, and used extensively in writing in northern Hindostan; the Guzeratic, or language of Guzerat; and the Nepaulic, or language of Nepaul. Nearly all these languages have different alphabets.—The most remarkable feature in the social life of Hindostan is the institution of castes, which exists only among the Hindoos proper, or the followers of the Brahminical religion, and is disregarded by the Mohammedans, Parsees, and several other portions of the native population. With the Hindoos caste is an institution of remote antiquity, and is based on the strongest religious convictions. It is taught in their ancient sacred books, and is interwoven with the whole framework of the civil and social polity. By the laws of caste the Hindoo people were originally divided into 4 tribes, the Brahmins or priests, the Kshatriyas or warriors and rulers, the Vaisyas or agriculturists and traders, and the Soodras or laborers and servants, all of whom proceeded from Brahma the creator. (See BRAHMA.) The subjugation of Hindostan to foreigners has necessarily deprived the Brahmins of many of their privileges, and they no longer enjoy any power over the lower classes except what is voluntarily

conceded to them. They alone, however, can possess and read the sacred books and perform religious rites, and this prerogative gives them great influence over the people. Their numbers are estimated at 10,000,000 or 12,000,000. They are distinguished from the other castes by a somewhat lighter complexion, and by a higher degree of intelligence and refinement of manners. At the present day the second and third of the original castes, the Kshatriyas and Vaisyas, no longer exist in a pure state. By wars and revolutions they have been extinguished as castes, and their descendants merged in a variety of mixed castes, which have sprung from unlawful connections, or which have been formed by divisions and subdivisions in the great servile caste of the Soodras. Many of the occupations originally assigned exclusively to the Kshatriyas and Vaisyas are now followed by Brahmins, it being one of the laws of Hindoo caste that the superior castes may if necessary get their living engage in the pursuits of the lower castes, though it is not allowed for the lower castes to usurp the functions of the higher. Brahmins now are found holding nearly all kinds of government offices, acting as soldiers, and even engaged in the service of Europeans, Mohammedans, and Hindoos of a lower caste than themselves. In all these positions, however, they take care not to transgress certain rules and observances which are essential to the preservation of their standing as members of their caste. If they engage in traffic, for example, they must avoid having any thing to do with certain commodities, such as leather, contact with which is considered polluting and destructive to the rights of caste. A Brahmin forfeits his rank and is excluded, as polluted, from the society of other Brahmins, by eating or even touching certain kinds of food, by sitting down to eat with one of an inferior caste, or even by the presence of such a one within a certain distance of the meal. There are castes so degraded that their mere shadow falling on a man of higher caste causes pollution. In Malabar when under native rule it was not uncommon for a man of high caste to strike dead on the spot a man of low caste for having touched him, even if accidentally; the act was regarded as justifiable homicide, and was not punished by the authorities. The condition of the lowest castes under native rule was one of the most abject subjection, and so debased were they considered both socially and spiritually, that it was a crime for a Brahmin to read the sacred writings in their presence, or to give them any religious counsel or instruction whatever. They were rigidly restricted to the occupations of their parents, and could by no possibility ascend out of the class in which they were born. Beneath the Soodras there was a numerous class of outcasts and their descendants, called pariahs, who, by forfeiting their standing in their respective castes and becoming polluted, had sunk to the lowest pitch of social degradation, and were regarded as utterly vile and contemptible. A loss of caste involved under the

native rule a forfeiture of all civil rights and of all property. The British government, however, has given protection to all its Hindoo subjects by a law promulgated in 1850, declaring that "so much of any law or usage in force within the British territories as inflicts on any person forfeiture of rights or property, or may be held to impair or affect any right of inheritance, by reason of his or her renouncing or having been excluded from the communion of any religion, or deprived of caste, shall cease to be enforced as law in the courts of the East India company, and in the courts established by the royal charter within the said territories." The promulgation of this law raised a great clamor among the Hindoos of the higher castes, but it has been steadily enforced, and has had an important and salutary effect upon the social state of Hindostan. The following lively description of some peculiarities of Hindoo manners is from Murray's "Handbook for India" (1859): "The natives of India attach more weight to form and ceremony than Europeans. It is considered highly disrespectful to use the left hand in salutation or in eating, or, in fact, on any other occasion when it can be avoided. Hindoos sometimes prostrate themselves with the arms stretched out and the hands joined; Moslems never. To remove the turban is disrespectful; and still more so not to put off the shoes on entering a strange house. Natives, when they make calls, never rise to go until they are dismissed, which among Mohammedans is done by giving betel and sprinkling rose essence, and with Hindoos by hanging wreaths of flowers round the visitor's neck, at least on great occasions. Discourteous Englishmen are apt to cut short a long visit by saying: *Ab jao*, 'Now go!' than which nothing can be more offensive. The best way is to say: 'Come and see me again soon,' or, 'Always make a practice of visiting my house,' which will be speedily understood. Or to one much inferior you may say: *Rukhsat lena*, 'Leave to go,' or better: *Rukhsat lijiye*, 'Please to take leave.' A letter closed by moistening the wafer or the gum with the saliva of the mouth should not be given to a native. The feet must not be put on a chair occupied by them, nor must the feet be raised so as to present the soles to them. One must avoid touching them as much as possible, especially their beards, which is a gross insult. If it can be avoided, it is better not to give a native three of any thing. Inquiries are never made after the female relations of a man. If they are mentioned at all, it must be as 'house.' 'Is your house well?' *i. e.*, 'Is your wife well?' There are innumerable observances to avoid the evil eye; and many expressions seemingly contradictory are adopted for this purpose. Thus, instead of our 'Take away,' it is proper to say: 'Set on more;' and for 'I heard you were sick,' 'I heard your enemies were sick.' With Mohammedans of rank it is better not to express admiration of any thing they possess, as they will certainly offer it; in case of acceptance, they would expect something

of more value in return. To approach a Hindoo of high caste while at his meal is to deprive him of his dinner; to drink out of his cup may deprive him of his caste or seriously compromise him with his caste-fellows. Leather is an abomination to Hindoos; as is every thing made from the pig, as a riding saddle, to the Moslem. When natives of different rank are present, you must be careful not to allow those to sit whose rank does not entitle them, and to give each his proper place. Hindoos in general will not kill insects; and a rajah will remove a bug from his turban and place it on your carpet with all care. To kill monkeys or peacocks may create a dangerous disturbance, as an order to put dogs to death produced a serious *émeute* among the Parsees in Bombay. Natives, in general, will not kill wolves. To kill a cow is with Hindoos a crime of the first magnitude." One of the most important features of the social organization of Hindostan is the system of townships or villages, which has prevailed for ages, and has survived through innumerable revolutions and conquests. Each township manages its own internal affairs, levies upon its members the taxes demanded by the state, organizes its own police, and is responsible for all property taken by thieves within its limits. It administers justice to its own members, punishing small offences and deciding petty lawsuits. It also keeps in repair the roads and public edifices, and provides for the maintenance of public worship and the support of the poor. For all these duties it provides the proper officers, who are paid by fees, sometimes in money, but more often in produce. Sir Charles Metcalfe, a distinguished English officer in India, said in a report published in 1832: "The village communities are little republics, having nearly every thing they can want within themselves, and almost independent of any foreign relations. They seem to last where nothing else lasts. Dynasty after dynasty tumbles down; revolution succeeds to revolution; Hindoo, Patan, Mogul, Mahratta, Sikh, English, all are masters in turn; but the village community remains the same. This union of the village communities, each one forming a separate little state in itself, has, as I conceive, contributed more than any other cause to the preservation of the people of India, through all the revolutions and changes which they have suffered, and is in a high degree conducive to their happiness, and to the enjoyment of a great portion of freedom and independence." Prominent among the native races who are neither Mohammedans nor Hindoos are the Parsees, or descendants of the ancient fire-worshippers, who fled from Persia several centuries ago in consequence of persecution by the Mohammedans, and are now numerous in Bombay and in some other cities in western Hindostan. They are the most intelligent, enterprising, and prosperous portion of the native population. (See GUEBRES.) The Sikhs, a peculiar religious sect, are numerous in the N. W., and have acted an important part in the modern history of Hindostan. (See SIKHS.)

—In Malabar the leading caste, the Nairs, are remarkable for their peculiar customs, and especially for their profligate manners. In the same country there are many Jews, one portion of whom have perfectly black complexions. There is also a large body of native Christians in Malabar, whom there is reason to believe to be descended from converts made at a very early period of our era. (See MALABAR.) For an account of other remarkable classes of the population of Hindostan, see EURASIANS, FAKIRS, and THUGS.—In none of the fine arts except architecture have the Hindoos attained much eminence. Their paintings are of very little merit, though the walls of temples, of palaces, and of the better class of private dwellings are often ornamented at great cost with pictures illustrating the characters and events of their mythology. More attention has been paid to sculpture than to painting, and in the temples cut from the living rock great numbers of statues are contained, some single figures and others large groups. Many of these are bold and spirited in design, though the human form is not exhibited in good proportion nor with its parts well developed. In many parts of Hindostan splendid monuments of architecture abound, mostly the work of past ages, and many of them of remote antiquity. Such are the Jain temples at Ajmeer and elsewhere, some of which were built long before the Christian era, and are distinguished not only for size and splendor of ornamentation, but for symmetry, beauty of proportion, and refinement of taste. The mosques, palaces, and tombs erected by the Mohammedan emperors of Hindostan are the finest specimens in the world of the Saracenic style of architecture. Those at Agra, Delhi, and Lucknow are especially remarkable for their delicacy, beauty, and taste. The most wonderful structures in the country are perhaps the great rock temples in the western part of the Deccan, and those near Bombay. Of these prodigious monuments a description is given in the articles EPHANTA and ELLORA.—The principal manufactures of Hindostan are of cotton and silk goods. Those of cotton appear to have been carried on from the remotest antiquity, and are renowned for fineness and beauty, though coarse stuffs are also made for common wear. The machinery of Europe and America has not succeeded in equalling the fabrics which the Hindoo workman produces from his rude loom by patience and unrivalled dexterity of hand. The goods chiefly made are muslins, plain, flowered, striped, or checkered, for which the province of Dacca is celebrated, and calicoes, which are made of brilliant and durable colors in Coromandel. Silks of admirable quality made into shawls and scarfs are manufactured in Mooltan, and tissues, brocades, and ornamented gauzes at Benares. Coarser cotton and silk goods are made in almost every part of the country. The internal commerce of Hindostan is very extensive, and has of late years been greatly facilitated by canals and railroads. An

active coasting trade is carried on between the ports of the different maritime provinces. The foreign trade has from the earliest antiquity been famous for its magnitude and lucrative nature, but yet it falls far short of the prodigious development of trade exhibited by Great Britain and the United States. The exports, consisting chiefly of coffee, cotton and cotton goods, grain, indigo, ivory, lac, opium, pepper, rum, raw silk, silk goods, shawls, saltpetre, sugar, and wool, amounted in 1858 to £17,407,185. The imports, consisting chiefly of books, clothing, cotton goods of English make, jewelry, malt liquor, metals and metallic manufactures, salt, spices, spirits, tea, woollen goods, wines, and specie, amounted in the same year to £18,944,675. —The chief public works in Hindostan of native construction are reservoirs or tanks for purposes of irrigation, which exist in immense numbers and frequently of great size and cost, being often magnificently built of stone. One of these tanks is said to be 8 m. long and 3 m. broad. There are also a number of canals constructed by the native princes in former ages, but these have mostly fallen into neglect and disuse. The British government has recently entered upon an extensive and systematic course of internal improvement. Immense canals, inferior to none in the world, have been made, the chief of which are those of the Jumna and the Ganges, to facilitate not only irrigation but the navigation of those rivers. These canals are respectively 580 and 900 m. in length. In the Punjab are 450 m. of canal, and there are other extensive works of similar character in the southern provinces. Several great lines of railroad are in progress, of which the principal are: from Calcutta to Delhi, 1,100 m.; from Bombay to Mirzapore, 750 m.; from Bombay to Baroda, 150 m.; from Madras to Bellary, 296 m.; from Madras to the west coast, 360 m. None of these are yet completed. Several thousand miles of electric telegraph have been opened, and several grand trunk highways completed, uniting Calcutta with remote points of the country. The average annual expenditure of the government for public works for several years past has been about £300,000. —The British government of India is administered by a governor-general, who has power to declare war, make peace, and form treaties with the neighboring nations. In conjunction with a council of 5 members, he makes laws and regulations for the whole of British India. He is governor of the presidency of Bengal. The presidencies of Madras and Bombay are each administered by a separate governor and council, over whom the governor-general has a controlling power. The government of the native states is completely despotic. The Hindoos and Mohammedans within the British territories are subject respectively to Hindoo and Mohammedan law and forms of legal procedure, but Europeans are subject to courts and law forms modelled on the English system, including trial by jury, which in certain localities is also extended over

the natives. For many years past a considerable sum has been annually given by the British government for the promotion of education among the natives. In 1792 a Sanscrit college was established at Benares, and in 1816 another at Calcutta; and in 1853 the number of seminaries for the instruction of natives amounted in Bengal alone to 40. There are many newspapers and other journals conducted by natives in the native languages, and the printing press is freely used by both Hindoos and Mohammedans. —Of the earliest period of the history of Hindostan little is known with certainty. The sacred writings of the Hindoos give to their ancient history an incredible chronology, extending over millions of years, and treat of heroes, kings, and dynasties, most of whom are probably merely mythical or fabulous. It is the general opinion of the best authorities that the Hindoos were not the first inhabitants of the country, but were an invading race who subdued and enslaved the aborigines, whose remnants are still existing in some rude tribes in the central and southern parts of Hindostan, such as the Bheels, the Coolees, the Goonds, and the Shanars. The distinction of castes did not exist among these people, and their religion seems to have consisted of the worship of a variety of spiritual deities. The Hindoos are supposed to have entered the country from the north-west, and are conjectured by some to have come from the Euphrates, by others from the Caspian sea. They brought with them the Brahminical religion, and formed the institution of caste by dividing themselves into the three higher castes of Brahmins, Kshattriyas, and Vaisyas, while the conquered people constituted the Soodras or servile caste. It is not known at what period this invasion took place, but it was undoubtedly prior to the 14th century B. C. The language of the conquerors was probably the Sanscrit, in which subsequently their sacred books were written. Two great dynasties, the kings of the race of the sun, who reigned in Ayodha, the modern Oude, and the race of the moon, who reigned in Pruyag, the modern Allahabad, figure in the legends of their early history. The most celebrated of these sovereigns was Rama or Ramchander, who is supposed to have lived in the 12th or 13th century B. C. His actions are the subject of the great epic poem the *Ramayana*. Subsequently long civil wars raged among the princes of the lunar race, which culminated in a great battle on the plain of Kuru, where the armies of 56 kings fought for 18 days. But the first event in the history of Hindostan, or of India, as it was termed by the ancients, of which we have a plain and authentic account, was the invasion by the Persians under King Darius, about 500 B. C. The Persian monarch conquered and annexed to his empire provinces on the Indus so rich and extensive that, according to the Grecian historians, their tribute furnished one third of the revenues of the Persian crown. The Hindoos of that period were described as a people "of black com-

plexions, who did not kill animals for food, but lived upon rice, grain, and fruits, who exposed to death those who were so sick that they were not expected to recover, and had horses of a small breed, and manufactured the cotton of the country into fine clothing." It is evident from this description that 2,000 years ago the people were essentially like their descendants of the present day. In 326 B. C. Alexander of Macedon, having overthrown the Persian empire, invaded India, defeated Porus, one of the kings of the country now called the Punjab, and penetrated with his army as far as the Hyphasis or Beas. The historians of his expedition describe the manners, customs, and pursuits of the Hindoos in a way that shows that little change has since taken place in those respects. In the division of the Macedonian empire after the death of Alexander, Seleucus, one of his generals, obtained the eastern part, and founded the Bactrian kingdom, which included the provinces on the Indus. He attempted conquests beyond that river, and was involved in war with Chandragupta, king of Magadi, whom the Greeks called Sandracottus. With this monarch Seleucus made a treaty by which the Greeks relinquished all claim to any possessions east of the Indus. The kingdom of Magadi comprised the greater part of northern and central India, and lasted till about A. D. 450. Its capital, Palibrotha, was on the Ganges, and is supposed to have occupied the site of the present city of Patna. It had relations both of a peaceful and warlike character with the Greeks of Bactria, and at one time paid tribute to the Bactrian monarchs. After its downfall Hindostan was divided into a number of hostile kingdoms, of whose history little is known. In the reign of the caliph Walid, about 715, the Mohammedan governor of Bassorah sent by sea an army of 6,000 men, commanded by Mohammed Causim, with orders to invade Hindostan and convert the people to Islamism. Causim landed near the mouth of the Indus, and succeeded in conquering Sindh and the southern part of the Punjab, which he held for some years. After his death a general insurrection of the Hindoos drove the Mohammedans out of the country. Hindostan remained unmolested from that time till 1001, when Mahmood, the Afghan sultan of Ghuznee, invaded and conquered a portion of the north. In the course of his reign of 35 years, which ended in 1030, he made 12 expeditions into Hindostan for conquest and plunder. He left extensive possessions in western Hindostan to his successors, one of whom, Sultan Ibrahim, greatly extended the Mohammedan rule. Ibrahim was succeeded by his son Masoud, who extended his conquests beyond the Ganges, and transferred his court from Ghuznee to Lahore. He was the first Mohammedan sovereign whose capital was within the limits of Hindostan. In the early part of the 12th century a civil war among the Mohammedan conquerors resulted in placing the house of Ghori on the

throne of Lahore. One of the monarchs of this dynasty, Shahab-ud-Deen, overthrew the kings of Delhi and Ajmeer, conquered Kanauj, Behares, Gwalior, Guzerat, and many other cities and provinces, and at the time of his death in 1206 was master of nearly all the country north of the Nerbudda, including Bengal, Sindh, and Guzerat. Under his successor, Cuttub-ud-Deen, a Turkish slave who had been educated by Shahab-ud-Deen, the Mohammedan dominions in Hindostan were separated from the Afghan empire and formed an independent kingdom, the capital of which was Delhi. Cuttub-ud-Deen was the founder of a dynasty known as the slave emperors, 10 in number, 6 of whom were violently deposed, and the last, Kei Kobad, was murdered in 1288. The most eminent of these sovereigns, Altumsh, extended his dominions by conquests southward, and at the end of his reign all Hindostan north of a line running from Surat to the mouth of the Ganges acknowledged the authority of the court of Delhi. Kei Kobad was succeeded by Jelal-ud-Deen, the founder of the dynasty known as the house of Khilji. During his reign, his nephew Alla-ud-Deen, an able and ambitious general, invaded and conquered a large part of the Deccan, and on his return from this expedition caused his uncle the emperor to be assassinated, and usurped the throne. He was one of the most eminent of the Mohammedan rulers of Hindostan, and in his reign of 20 years considerably enlarged the empire, maintained a brilliant court, patronized learning and the arts, and successfully repelled several great invasions of the Moguls or Tartars who had established themselves in the countries west of the Indus. He died in 1316, poisoned, it was generally thought, by his vizier. His 3 successors died by violence, and in 1321 the house of Khilji became extinct. Five emperors of that dynasty had reigned 33 years, and all had perished by poison or the sword. Togluck Shah, the founder of the house of Togluck, ascended the vacant throne in 1321. He was one of the best of the Mohammedan sovereigns of Hindostan, but his reign only lasted 4 years, when he was killed by the fall of a pavilion which is supposed to have been insecurely built on purpose by his son, who succeeded him under the name of Mohammed Togluck, and after a reign of about 27 years died in 1351, leaving, says a historian, "the reputation of one of the most accomplished princes and most furious tyrants that ever adorned or disgraced human nature." During this disorderly reign Bengal and several of the provinces of southern Hindostan became independent. Mohammed Togluck was succeeded after a short civil war by a sultan of the same name, who reigned for 38 years, and was distinguished for humanity and for the vast number of public works which he constructed and endowed with revenues. Among these are enumerated 50 canals, 30 reservoirs, 150 bridges, 30 colleges, 40 mosques, 100 hospitals, 100 public baths, and 100 caravansaries. Though these numbers are probably not strictly accurate, the immense re-

mains of the works executed by this emperor are sufficient to attest his magnificence and public spirit. In the reign of his grandson, Mahmoud Shah, in 1398, Hindostan was invaded by the famous Tartar conqueror Tamerlane, who captured Delhi, plundered and slaughtered the inhabitants with frightful barbarity, and caused himself to be proclaimed emperor of India. At the end of 15 days, however, he abruptly quit Delhi and returned to his own country, "marking his way with fire and sword, and leaving anarchy, famine, and pestilence behind him." The governors of the various provinces of the empire proclaimed their independence of Delhi, and assumed royal titles, so that only a small district remained subject to the authority of the imperial capital. Half a century of anarchy succeeded, during which there were 7 titular emperors in Delhi, who however had no real authority beyond the walls of the city. At length in 1450 Beylol Lodi, an Afghan military chief of talent and energy, made himself emperor, and in a long reign of 38 years succeeded in recovering many of the provinces which had formerly belonged to the empire. His son Secunder still further enlarged his dominions in a reign of 28 years, during the latter part of which he made Agra his capital. Secunder was succeeded by his son Ibrahim, in whose reign Hindostan was again invaded by the Moguls, led by a descendant of Tamerlane, the celebrated Baber, sultan of Cabool. Ibrahim was defeated and slain in battle on the plains of Paniput in 1526, and Baber ascended the throne with little further opposition, the imperial cities of Delhi and Agra surrendering without resistance. In the course of his reign of 5 years, Baber, who had remained in Hindostan, made himself master of all the provinces which had belonged to his predecessor. He died in Dec. 1530, and was succeeded by his son Humayoun, who allowed one of his brothers to hold Cabool and the rest of Afghanistan as an independent kingdom, and contented himself with his Indian dominions. These he was deprived of at the end of 9 years by Shere Khan, the governor of Bengal, a man of great military talents, who rebelled, defeated the emperor in several battles, and finally compelled him to fly for refuge to Persia. Shere Khan was then proclaimed emperor of Delhi, with the title of Shere Shah. He reigned with wisdom and success for 3 years, when he was killed by the explosion of a magazine while directing the siege of a rebellious fortress. He was succeeded by his son Selim Shah Soor, and by his grandson Feroze Khan, the latter of whom after a few days' reign was murdered by his uncle Mubari, who usurped the throne and took the name of Mohammed Shah. In the mean time the exiled Humayoun, by the aid of the king of Persia, had made himself master of Cabool, and now resolved on attempting the recovery of the throne of Delhi, from which he had been driven 16 years before. This he successfully accomplished by the aid of his heroic son Akbar, but

he did not survive his restoration to power more than a few months, being killed by an accidental fall from the terrace of his palace at Delhi. Akbar, who succeeded his father in 1556, reigned for 49 years. He is reputed the ablest, the most liberal, and most powerful of the Mogul emperors of Hindostan. He restored the empire to its former bounds, reorganized the army and the finances in a statesmanlike manner, so that his revenues were largely increased while the burdens of the people were diminished, and treated all religions with respect and impartiality, freely admitting the Hindoos to a share in the administration of public affairs, from which they had hitherto been jealously excluded by their Mohammedan masters. Akbar was succeeded in 1605 by his son Selim, who took the title of Jehangheer, or "conqueror of the world." In the early part of his reign he was intemperate, capricious, and cruel; but his habits and conduct greatly improved after his marriage with the celebrated Nourmahal, "the light of the harem," one of the most extraordinary and accomplished women recorded in history, whose influence over the emperor was so great that it is said he took no step without consulting her, and that on every affair in which she took an interest her will was law. The last years of Jehangheer were embittered by the quarrels of his 4 sons, each of whom aimed at the succession, and who were at times in open rebellion against their father. He died in 1627, after a reign of 22 years. He was succeeded by his favorite son Shah Jehan, whose first step was to put to death all his relations, so that there remained not a drop of the blood of Tamerlane in India except what flowed in his own and his children's veins. The Deccan in his reign was completely subdued and rendered tributary, and a long and eventually unsuccessful war waged with the Persians and the Afghans. In 1657 he fell very ill, and being thought to be dying, his son Dara, the heir apparent, assumed the reins of government. The other sons, Shuja, Morad, and Aurungzebe, who had each been appointed viceroys over important provinces, immediately revolted and prepared by force of arms to assert their pretensions to the succession. Shuja was defeated, but Aurungzebe by stratagem obtained possession of his father's person, and kept him a prisoner till he died, 7 years afterward. Morad also was soon seized and imprisoned by Aurungzebe, who caused himself to be proclaimed emperor. Dara continued the contest for some time longer, but was finally captured and put to death. Shuja was driven with his family into exile, where they all perished. The reign of Aurungzebe, though it began with civil war and confusion, was more peaceful and orderly than that of any of his successors. The Mogul empire in India attained under him its greatest extent, including nearly all that is now known as Hindostan. He died in 1707 in the 89th year of his age, after a reign of 49 years. He was possessed of great talents, and was eminent both as a states-

man and a soldier. The Mohammedan historians regard him as the greatest of all the Mogul emperors. During his reign the foundation of the Mahratta empire was laid in the Deccan by an adventurer named Shevaje. (See MAHRATTAS.) Aurungzebe's eldest son, who succeeded him under the title of Bahadoor Shah, was involved at the beginning of his reign in civil war with two of his brothers, both of whom were defeated and killed in battle, and toward the end of his reign in war with the Sikhs, who were just beginning to acquire importance in the north-west of Hindostan. He died in 1712, and was succeeded by his eldest son Jehander Shah, a weak and profligate ruler, who in the second year of his reign was put to death by his rebellious nephew Ferokhsere, who ascended the throne in 1713. His reign lasted 6 years, and was remarkable only for conspiracies, insurrections, and general disorders in the capital and the provinces. He was at length put to death by his viziers, who in the course of the next 8 months successively placed on the throne 3 infant descendants of Aurungzebe, the last of whom, Mohammed Shah, a youth of 17, soon became impatient of their control, of which he got rid by causing one to be assassinated and the other deprived of office. The emperor, however, was fickle and dissolute, and his dominions were invaded on one side by the Mahrattas, now rapidly becoming formidable, and on the other by the Persians, whose warlike monarch, Nadir Shah, passed the Indus with a great army, and, overthrowing the imperial forces, took possession of Delhi in 1739. He remained several weeks in the Mogul capital, which he plundered of treasure amounting, according to the lowest estimate, to \$100,000,000, after massacring a great part of the inhabitants. He then returned to his own country, leaving Mohammed Shah in possession of his throne, and depriving him only of the provinces west of the Indus. Mohammed Shah died in 1748, and was succeeded by his son Ahmed Shah, who after a reign of 6 years was deposed, and Aulumgheer raised to the throne, in the 3d year of whose reign Hindostan was invaded by the Afghans, and again plundered. The Mahrattas, who were now at the height of their power, took advantage of the distress of the empire, and carried their arms into the northern provinces. The Afghans met them at Paniput in Jan. 1761, and a great battle was fought, the forces on both sides amounting to 400,000 men. The Mahrattas were defeated with great slaughter, and it is said that 200,000 of them perished in the battle and the pursuit. The Afghans returned to their own country after this great victory, and left the government of Delhi to take care of itself. From this time, however, the Mogul empire was practically at an end. The English had now become the most important power in Hindostan. (See EAST INDIA COMPANY.) The first of the nations of modern Europe who obtained territorial possessions in Hindostan were the Portuguese, who early in the 16th cen-

tury seized some ports on the western coast, and in the course of the century made themselves masters of Diu, Damaun, Bassein, Salsette, Bombay, Choul, Dabool, Goa, Onore, Barcelore, Mangalore, Cannanore, Cranganore, Calicut, Cochin, and Quilon, in the west, and Negapatam, St. Thome, and Masulipatam, on the eastern coast. They held also several places in Bengal, and a considerable part of Ceylon. Their capital was Goa, where they maintained a viceroy and an archbishop. During the union of Portugal with Spain, from 1580 to 1640, these distant possessions were neglected, and most of them were taken by the Dutch or regained by the native powers. Goa and a few small places of no political or commercial importance are all that now remain of the Portuguese empire in India. The English East India company first acquired territory in Hindostan in 1640, when Madras was ceded to them by a native prince. In 1669 the island of Bombay was ceded to them by Charles II., who had acquired it as part of the dowry of his wife, the infanta of Portugal. In 1687 it was made the chief seat of the British government in India. It was in Bengal, however, that the company first began to acquire military and political power. They took into their pay bodies of native soldiers who were called sepoys, and were armed and trained in the European manner, and with the aid of these mercenaries they soon acquired a considerable degree of influence in the country. In 1744, France and England being at war in Europe, hostilities broke out between the English and French in India. The capital of the French possessions was Pondicherry, which had dependent on it 3 factories, one at Mahé on the Malabar coast, one at Karikal on the Coromandel coast, and one at Chandernagore in Bengal. The contest in Hindostan, though conducted with great energy and ability by Dupleix and Bussy on the part of the French, and by Laurence and Clive on the part of the English, led at that time to no important results, but was renewed in 1756. In that year Surajah Dowlah became nabob or viceroy of Bengal, and, having always disliked the English, soon found a pretext for making war upon them. Commencing hostilities suddenly, while the English were yet unprepared, he captured Calcutta; and the English portion of the garrison of Fort William, amounting to 146 persons, of whom Mr. Holwell was the chief, were shut up in the "Black Hole," where most of them perished in a single night by suffocation. (See BLACK HOLE.) Clive soon retook Calcutta with a force from Madras, captured Chandernagore and its French garrison, and after various other successes defeated the nabob's army in the decisive battle of Plassey, June 23, 1757. Surajah Dowlah was dethroned and put to death, and his vizier Meer Jaffier raised to the vacant throne. The new nabob granted to the English, as the price of their support, an immense sum of money, a large accession of territory, and permission to keep such of the French posts and factories as they

could conquer. These transactions involved the English in a war with the emperor of Delhi, and with his vassal the nabob of Oude. Both the emperor and the nabob succumbed after a brief contest, and by the treaty of peace the emperor conferred upon the British the 3 provinces of Bengal, Bahar, and Orissa, together with the maritime districts known as the Northern Circars. The real sovereign of the Northern Circars was a potentate called the nizam of the Deccan, who gave to the emperor of Delhi only a nominal allegiance. The nizam, however, consented to the cession of the Circars on condition that the English should aid him with troops in case he was attacked by any other power. In 1760 he demanded their assistance against Hyder Ali, the warlike and politic sovereign of Mysore. In the war that ensued the English, notwithstanding some successes, were so hard pressed that they sought to stop the progress of Hyder by negotiation, and at last concluded, in April, 1769, a treaty with him which resulted in a mutual restitution of conquests. The British arms were next directed against the Mahrattas, who had invaded the territories of their ally the nabob of Oude. This war ended in the acquisition of the Rohilla country, and soon afterward the province of Benares was ceded to the British. In a subsequent war with the Mahrattas considerable conquests were made, which were nearly all given up by a peace hastily concluded with them in consequence of the breaking out of a war with Hyder Ali in 1780, who died Dec. 7, 1782, while the war yet raged, leaving his kingdom to his son Tippoo Sultan, who in the succeeding year agreed to a treaty of peace. In 1790, however, he again became at war with the English by an attack upon the kingdom of Travancore, which was under their protection. Lord Cornwallis, distinguished in the history of the American revolution, was at that time governor-general of India, and conducted the contest with such energy, that in 1791 Tippoo was compelled to agree to a treaty by which he ceded to the English about half of his dominions, and paid them in cash \$16,500,000. In 1798 Tippoo was incited by French emissaries again to make war on the British, which resulted in the storming of his capital, Seringapatam, and his own death in the conflict, May 4, 1799. His dominions were divided between the English and their ally the nizam. In 1803 a war broke out between the English and the Mahrattas, which proved to be the most serious ever waged by them in Hindostan. It was conducted by Gen. Lake and by Sir Arthur Wellesley, afterward the duke of Wellington, and by the brilliant success of these great commanders was terminated in Nov. 1803, with the destruction of the Mahratta power and a vast acquisition of territory by the British. In consequence of border forays and outrages, war was declared against Nepal in 1814, which resulted in a further augmentation of British territory. The same result followed from wars with Holkar, the peishwa, the rajah of Nagpur, and other powerful chiefs. Much trouble

at this period was experienced from a formidable force of mounted marauders called Pindaries, who were finally subdued about 1820. A war with the Burmese in 1824-'5 led to large accessions of territory on the eastern frontier. The Afghan war which began in 1839, after great disasters to the English arms, amply redeemed by subsequent successes, terminated in the withdrawal of the British from Afghanistan. The annexation of Sind in 1843, and the great war with the Sikhs in 1845, were followed by the annexation of the Punjab in 1849. A second war with the Burmese terminated after a short contest, in Dec. 1852, with the acquisition of the extensive province of Pegu. In 1856 the kingdom of Oude, which had for some years been in a state of confusion, was annexed to the British dominions on the ground of its extreme and scandalous misgovernment.—The next important event in the history of Hindostan was one which attracted the universal attention of mankind in all quarters of the globe, and forms unquestionably the most impressive incident in the annals of British India from the commencement to the present time; we mean the great sepoy revolt. In the early part of 1857 it became apparent that a mutinous spirit had crept into the Bengal army. The government had resolved to arm the sepoys with Enfield rifles, and a new kind of cartridge, greased in order to adapt it to the rifle bore, was accordingly introduced into the depot of musketry instruction at Dumdum. A report spread among the native troops that the government intended to make them give up their religion by causing them, as the cartridges in loading had to be torn with the teeth, to bite the fat of pigs and of cows, the former of which would be defilement to a Mussulman, and the latter would be sacrilege in the eyes of a Hindoo. The wildest excitement prevailed for a time, but the substitution of the old for the new cartridges temporarily prevented an outbreak. Meanwhile, though the greased cartridges had not been used elsewhere, the cry of danger to caste and creed was raised in many other stations. Disturbances occurred on Feb. 26 at Berhampoor; March 26 at Umballa, 1,000 m. distant; March 29 at Barrackpore, where the first blood of the revolt was shed; and April 24 at Meerut. On May 10 a formidable rising took place at the latter station. The Europeans were massacred, and the mutineers marched to Delhi, where the garrison fraternized with them and a second butchery was committed. The rebels proclaimed the restoration of the Mogul dynasty, and thenceforth acted in the name of the king of Delhi, though without much deference to his orders. The king appointed one Mirza Mogul his commander-in-chief, and collected an army of 8,000 or 9,000 men. With this signal event the revolt may be said to have fairly begun, and Delhi became a rallying point for the mutineers from other quarters. A conspiracy was detected and crushed at Calcutta. In the N. W. provinces risings took place almost simultaneously at

Allyghur, Boolundshahur, Minpooree, Nusseerabad, Shahjehanpore, Etawah, and Bareilly. The sacred city of Benares on the Ganges was in revolt on June 4, and on the next day at the military station of Cawnpore several thousand sepoys revolted and placed themselves under the command of the Nena Sahib, rajah of Bittoor. (See BITTOOR, and CAWNPORE.) About the same time the ferocious ranee (princess) of Jhansi in Bundelcund took the field at the head of two regiments which mutinied at Jhansi, June 4. Jounpore (June 5), Allahabad (6th), Futtehpoor (9th), Nowgong (10th), Bandah (14th), Mozuffernugger (30th), Agra (July 4), Jhylum (7th), Sangor (7th), Senkote (9th), Segowlie (24th), Dinapoor (25th), and Rangurh (31st), were next the theatres of commotion, and in many instances of massacre. In the recently annexed kingdom of Oude, from which a large proportion of the sepoys in the Bengal army had been recruited, the rising, which elsewhere was purely military, partook of the character of a popular insurrection, the people generally siding with the rebels. The native troops at Lucknow, the capital, mutinied May 30 and 31, and nearly every sepoy regiment in Oude soon followed their example. The troops proclaimed allegiance to the ex-king of Oude, and gradually closed around Lucknow, where they began to besiege the Europeans about July 1. The principal theatres of rebellion during the rest of the year were Colapoor (Aug. 1), Berhampoor (14th), and Dacca (Nov. 20). The Punjaub was saved by the administrative capacity of Sir John Lawrence; a few risings took place, but the rebels were nearly all cut to pieces, and the suspected regiments seasonably disarmed. The presidency of Bombay was but little disturbed (see BOMBAY), and that of Madras was tranquil with scarcely an exception. Lower Bengal was also comparatively quiet, the most serious commotions being in Bahar, Rohileund, Bundelcund, the Doab, Malwah, Rajpootana, and Oude. The two principal Mahratta chiefs, Sindia at Gwalior and Holkar at Indore, remained faithful, but the revolt of their respective contingents was one of the most serious disasters to the British during the war. In May, 1857, the Bengal army comprised 22,698 Europeans (including the officers of native regiments), and 118,663 natives. The native force was disposed in 167 regiments and irregular corps, of which by the end of December 76 had mutinied and 27 had been disarmed or disbanded. As soon as the revolt broke out the British made strong efforts to suppress it; but the resources of treachery, the paucity of European troops, and the absence of means of transport gave the rebels an immense advantage. Gen. Anson, the commander-in-chief, died May 27, 1857, soon after taking the field, and was succeeded provisionally by Gen. Reed. The first movements were against Delhi, which was stormed Sept. 14, 1857, after a siege of 3 months, conducted successively by Gens. Barnard, Reed, and Wilson. The king was captured and ultimately sentenced to per-

petual exile, but most of the rebels escaped. Meanwhile Gen. Havelock, having collected a small force at Allahabad, moved toward Cawnpore, where the Europeans had been sustaining a siege, but he arrived too late to prevent the massacre of a large number of women and children, who were cruelly put to death, July 15, the day before he entered the city. He followed the Nena Sahib to Bittoor, defeated him, and, having been joined by Gens. Outram and Neill, crossed into Oude to relieve Lucknow, where the garrison under Col. Inglis was now reduced to extremities. He fought his way into the city, Sept. 25, Gen. Neill being killed in the action, but beyond an accession of numbers the besieged received no benefit from his arrival. Their condition remained unchanged until Sir Colin Campbell, who had arrived in India Aug. 14, with the rank of commander-in-chief, relieved them, Nov. 14, and enabled them to withdraw to Cawnpore. Gen. Havelock died Nov. 25. On Dec. 6 Sir Colin Campbell defeated the Nena Sahib with 25,000 rebels at Cawnpore, and, making that city a centre of operations, proceeded to attack the rebels of the N. W. provinces in several quarters at once, with a view of driving them into Oude, where a combined movement could subsequently crush them all together. The brigades of Lugard, Hope Grant, Sir Hugh Rose, Roberts, Stenart, Showers, Stuart, and others, did good service in the disturbed districts, and Gen. Outram continued to hold the Alumbagh fort near Lucknow, which had not been evacuated with the city. By Jan. 1, 1858, 23 European regiments had arrived at Calcutta, beside those which landed at Madras and Bombay; the Nepalese chieftain Jung Bahadoor furnished a valuable subsidiary force of Gorkhas, the Sikhs were enlisted, and Lawrence was able to supply troops from the Punjaub. Lucknow was gradually conquered by Campbell and Jung Bahadoor (March 2-21), and the army which had been concentrated for this purpose was then broken up into detachments for service in Rohileund and other districts. Sir Hugh Rose, with a detachment from the Bombay army, stormed Jhansi April 2, and pursued the ranee and the notorious Tantia Topee to Calpee, where he defeated them, and thence to Gwalior, which had now become the stronghold of the mutiny, as Delhi and Lucknow had been before it. Gwalior was taken June 20, after the ranees had been killed. This was the last great battle of the campaign, although the rebels, headed by the Nena, the begum of Oude, Tantia Topee, Maun Singh, and Feroze Shah, a prince of the house of Delhi, maintained an obstinate resistance throughout 1858-'9. Though repeatedly beaten in the field, they always escaped destruction to reappear in another quarter. They took refuge in the thick jungles of Jugdispoor and similar wild regions, and even after the most brilliant successes the British could never boast of a decisive victory. Oude was gradually pacified, however, in the autumn, and about Feb. 1, 1859, Sir Colin Campbell declared

the campaign there at an end. The whole population was disarmed in the course of the spring and summer, 1,327 forts being destroyed and 1,367,406 arms of all kinds surrendered. Maun Singh gave himself up, April 2, and assisted Col. Mead to capture Tantia Topce, who was tried by court martial at Sepree, and hanged April 18. On July 28 a day of general thanksgiving for peace was observed throughout India. A special disarming act passed by the legislative council during the mutiny was made permanent. The house of Delhi was deprived of all titular honors and dignities for ever, and the governor-general finally issued an order disposing of the remnants of the Bengal army, abolishing the native cavalry and artillery, and re-arming 14 of the disarmed infantry regiments. Though the British authority has been restored, parts of India are still (Jan. 1860) infested by the remnants of the mutineers, probably 8,000 or 10,000 strong, under the Nena Sahib and the begum. A fresh campaign was opened in Bundelcund in Nov. 1859, and efforts are in progress to drive the rebels into Nepaul, where Jung Bahadoor has pledged himself for their extirpation. Of the number of Europeans massacred or killed in battle during this mutiny no accurate estimate can be formed. Hundreds of English women and children were put to death after horrible outrages, many stories of which were perhaps fictions or exaggerations, though unhappily the substantial truth of the accounts of these atrocities cannot be doubted. (See BARRACKPOOR, BITTOOR, CAMPBELL (SIR COLIN), CAWNPORE, DELHI, GWALIOR, HAVELOCK, LUCKNOW, &c.) One very important result of the mutiny was the transfer of the government of India from the East India company to the direct authority of the imperial crown. This was done by an act of parliament which received the royal assent Aug. 2, 1858. This act provides for the appointment of a secretary of state for India, to be assisted by a council of 15 persons, 9 of whom must have had at least 10 years' experience in India, and 8 of whom are to be appointed by the crown and 7 by the court of directors of the East India company. To this council, which sits at London, is committed the exclusive control of the government of India from England, including the appointment of the governor-general and other high officers. The transfer of the company's European army into the royal army gave rise in the latter part of 1859 to some disturbance among a portion of the force, but the matter was at length satisfactorily adjusted.—For histories of Hindostan, see James Mill, "History of British India" (4th ed., 6 vols. 8vo., London, 1840); Mountstuart Elphinstone, "History of India" (2 vols. 8vo., London, 1842); W. C. Taylor, "A Popular History of British India" (London, 1842); Edward Thornton, "History of the British Empire in India" (6 vols. 8vo., London, 1842-5); Thomas Keightley, "History of India" (London, 1847); Hugh Murray, "British India" (Edinburgh, 1840; new ed., London,

1855); David O. Allen, "India, Ancient and Modern" (Boston, 1856); "A Chronicle of the Revolt in India" (Edinburgh, 1858-9).

HINDE, a W. co. of Miss., bounded E. by Pearl river and N. W. by the Big Black; area, 850 sq. m.; pop. in 1850, 25,340, of whom 16,625 were slaves. It has a level surface and a rich soil. The productions in 1850 were 853,305 bushels of Indian corn, 61,689 of oats, 240,435 of sweet potatoes, 79,000 of peas and beans (the greatest quantity produced by any county in the United States), 19,529 bales of cotton, and 105,650 lbs. of rice. There were 55 grist mills, 10 saw mills, 4 newspaper offices, 26 churches, and 767 pupils attending public schools. The county contains Jackson, the state capital, and is intersected by the New Orleans, Jackson, and great northern, and the southern Mississippi railroads. A branch of the latter extends to Raymond, the county seat.

HINGHAM, a township of Plymouth co., Mass., pleasantly situated on the S. side of Boston harbor, 14 m. S. from Boston, with which it has communication by the South Shore railroad; pop. in 1855, 4,256. It is a place of resort for residents of the city, and is largely interested in the fisheries and in manufactures. In 1855 it had 20 vessels employed in the cod and mackerel fisheries, with a capital of \$59,785. They employed 264 hands, and took \$44,364 worth of mackerel and \$4,500 worth of cod. In the same year Hingham had 2 manufactories of hollow ware and castings, 1 of nails, 2 of axes, 4 of saddles and harness, 3 of hats and caps, 1 of cordage, 1 of sails, 2 of salt, 2 of railroad cars, &c., 2 of cabinet ware, 3 currying establishments, 2 tanneries, and 13 forges. Value of manufactures, \$528,516; hands employed, 768. In 1858 the township contained 7 churches (1 Baptist, 4 Congregational, 1 Methodist, and 1 Universalist), and a weekly newspaper office. Hingham was settled in 1633.

HINTON, JOHN HOWARD, an English clergyman and author, born about 1800. He first preached at Reading, and afterward at London, as minister of a Baptist congregation. He had the reputation of being an independent and original preacher, and he was a zealous advocate for the voluntary principle in religion and education. He edited the "History and Topography of the United States," published in numbers and completed in 1832, in which he received the assistance of several European and American writers. An American edition of this work has been published under the supervision of John O. Choules, D.D. (2 vols. 4to., 1853). Mr. Hinton has also written "Memoirs of William Knibb;" "Theology, or an Attempt toward a Consistent View of the Whole Council of God;" "Elements of Natural History," &c.

HIPPARCHUS, an ancient astronomer, born in Nicæa in Bithynia, flourished in the middle of the 2d century B. C. We have no details of his life, and our knowledge of his astronomical discoveries is derived altogether from his disciple Ptolemy. He was the first who sys-

tematically attempted to classify the stars, and to determine their position and magnitude. To his catalogue we are indebted for our knowledge of the retrograde motion of the equinoctial points. He was the inventor of the planisphere, or mode of representing the heavens on a plane, and he conceived the idea of marking the position of places on the earth by circles drawn perpendicular and parallel to the equator. His only work still extant is the "Commentary on the Phenomena of Aratus and Eudoxus," the best edition of which is that of Petavius (Paris, 1630).

HIPPARCHUS AND HIPPIAS, the sons and successors of Pisistratus, tyrant of Athens. According to popular opinion, Hipparchus was the elder brother; according to Thucydides and Herodotus, Hippias. While they ruled jointly the government was conducted on the same principles as that of their father, and that period was subsequently regarded by the Athenians as a kind of golden age; but from the murder of Hipparchus by Harmodius and Aristogiton (514 B. C.) the character of the government of Hippias became arbitrary, exacting, and oppressive. His despotism was, however, at length overthrown. The Delphic oracle was bribed to favor the cause of liberty, and the pythoress repeatedly enjoined the Lacedæmonians to free Athens from the despotism of the Pisistratidæ. A Spartan force under Cleomenes, having defeated Hippias in the field, and captured his children, compelled him to surrender the Acropolis, and to evacuate Attica with all his relatives (510). No sooner had they departed than a decree was passed condemning the tyrant and his family to perpetual banishment, and a monument erected in the Acropolis commemorative of their crimes and oppressions. Hippias retired ultimately to the court of Darius, and there instigated the invasion of Greece. According to some he fell at Marathon (490).

HIPPO, surnamed Regius (the Royal), an ancient city of Numidia, the ruins of which are still to be seen near Bona in Algeria. It was one of the residences of the Numidian kings, and afterward celebrated as the episcopal see of St. Augustine. It was taken and destroyed by the Vandals in 480. Its surname served to distinguish it from another town of the same name on the Carthaginian coast, W. of Utica.

HIPPOCRATES, a Grecian physician, called the "father of medicine," born in the island of Cos in 460 B. C., died in Larissa, Thessaly, between 375 and 351 B. C. He studied medicine with his father Heraclides, who belonged to the order of Asclepiadæ, or descendants of Æsculapius, and afterward went to Athens to place himself under the instruction of Herodicius. He was a pupil of the philosopher Gorgias of Leontini, and perhaps also of Democritus of Abdera. Having practised his profession in Cos, he travelled through Thessaly, Macedonia, and Scythia, and finally returned to Thessaly, where he passed the close of his life. The esteem in which he was held by his contemporaries renders very improbable the story that,

having charge of a library at Cos or Cnidus, he made too free a use of the writings of others, and burned the collection to conceal his plagiarisms. Hippocrates raised medicine from a system of superstitious rites practised wholly by the priests to the dignity of a learned profession. He referred diseases to two leading causes, climate and diet, and regulated the latter to suit the changes of the former as well as the state of the patient. He taught that there were 4 humors in the human body, blood, phlegm, yellow bile, and black bile, an undue preponderance of any of which was a proximate cause of sickness. With such an imperfect knowledge of anatomy as might have been looked for in an age when superstition forbade the dissection of dead bodies, he nevertheless had some acquaintance with the structure of the cranium and viscera, but he was ignorant of the difference between veins, arteries, nerves, tendons, and ligaments, speaks of the muscles simply as flesh, and held some singular views on generation. He drew his principles from careful observation, and was little given to theorizing. He relied perhaps too much on the healing power of nature, and the remedies by which he assisted her were mostly of a simple character. He practised bleeding, cupping, cauterization, and auscultation, and, beside several mineral and vegetable remedies, used purgatives. He was particularly skilful in his diagnoses, and was the first to divide the course of a disease into 3 periods, for the last of which, called the crisis, he assigned certain days known as the critical days. Of the 72 books which bear the name of Hippocrates, only the "Aphorisms," "Prognostics," "Epidemics," the treatise on "Air, Water, and Locality," the treatise on "Diet," and a few others, can be attributed with much probability to the subject of this notice. Many were doubtless written by other physicians of the same name, of whom there were no fewer than 7 among the Asclepiadæ. Hippocrates wrote in the Ionic dialect, with a concise and sometimes obscure style. The best editions of his works are those of Fœsius (fol., Frankfort, 1595); Linden (2 vols. 8vo., Amsterdam, 1665); Mack (2 vols. fol., Vienna, 1743-'9); and Littré (8 vols. 8vo., Paris, 1839-'53), with a French translation. There are English translations of the aphorisms and the treatises on "Air, Water, and Situation, upon Epidemical Diseases and upon Prognostics," &c., by Francis Clifton, M. D. (8vo., London, 1734), and of the "Genuine Works" of Hippocrates by Adams (2 vols. 8vo., London, 1849).

HIPPOCRENE (Gr. ἵππος, horse, and κρήνη, fountain), called by Persius *Fons Caballinus* (the fountain of the horse), a fountain on Mount Helicon in Boeotia, owing its name to a myth according to which it was produced by Pegasus striking the ground with his feet.

HIPPODROME (Gr. ἵππος, horse, and δρόμος, a course), the course where the horse and chariot races of the ancient Greeks took place. The hippodrome was differently constructed

according to the nature of the ground. In level countries artificial mounds were raised on both sides of it; in hilly districts a declivity was invariably chosen to form one side. The artificial mounds, or mound and declivity as the case might be, were connected at the inner end by a semi-circular barrier. At the other or outer extremity was the portico, where each chariot had its stall, and whence it issued as soon as the cord which crossed the entrance was removed. A bronze eagle and dolphin were used as a signal at the time of starting; the eagle was raised in the air, while the dolphin was lowered. Along the sides of the hippodrome seats were erected for the spectators, special seats being reserved for the judges. The most celebrated of Hellenic hippodromes was that of Olympia.

HIPPOGRIFF (It. *ippogrifo*, from Gr. *ἵππος*, horse, and *γρύψ*, a griffin), a fabulous animal, unknown to the classical mythology, and first introduced by Boiardo as a steed worthy of the heroes of chivalry. It was represented as a winged horse, with the head of a griffin. It figures prominently in the *Orlando Furioso* of Ariosto. Wieland in his "Oberon" makes the hippogriff the steed of the muses, like the Pegasus of the middle ages, and calls upon them to mount it for a journey into the realm of romance.

HIPPOLYTUS, SAINT, an ecclesiastical writer of the 3d century, whose life and labors had long been shrouded in obscurity, until very recently a happy literary discovery shed clearer light upon them. He was said by Eusebius and Jerome to have left valuable commentaries on the Scriptures, and polemical writings. An old catalogue of the popes, the *Catalogus Liberianus* (about A. D. 354), calls him only presbyter. The *Chronicon Paschale* (about 306) and later accounts make him bishop of Portus Romanus, at the mouth of the Tiber. If at that early period, as Bunsen thinks, the Roman suburban bishops were at the same time members of the Roman college of presbyters, he may have been both. In 1551 his statue was found in the Ager Veranus, near Rome, with the Easter cycle engraved upon his cathedra and a catalogue of his writings, and gave a new impulse to research respecting him. But much more important is the recent discovery of one of his principal works, the *Philosophoumena*, or "Refutation of all Heresies." If, as is almost universally acknowledged, Hippolytus was the author of this work, he took an active part in all the doctrinal and ritual controversies of the time, and fell into disfavor with the Roman bishops Zephyrinus and Callistus (202-223), the latter of whom he attacked with earnestness and not without passion. Schaff in his "Church History" thinks that he was the head of a disaffected party, orthodox in doctrine and rigorous in discipline, and thus very nearly allied to the Montanists before him and to the later schism of Novatian. According to a later tradition, he finally returned into the bosom of the Catholic church, and expiated his schism by

martyrdom, either in Sardinia or more probably in Rome (A. D. 235, or rather 236), under the emperor Maximinus the Thracian. His works (*S. Hippolyti Opera*) were published by J. A. Fabricius (2 vols., Hamburg, 1716-18), and by Gallandi, in *Bibliotheca Patrum*, vol. ii. The *Philosophoumena* were discovered at Mt. Athos in 1842, in a Greek MS. now in the imperial library of Paris. The first edition of this work appeared under the name of Origen: *Οριγενους Φιλοσοφουμενα η κατα Πασων Αιρεσεων Ελεγχος* (Oxford, 1851). Under the name of Hippolytus (*S. Hippolyti Episc. et Mart. Refutationes Omnium Haresium Librorum decem quæ supersunt*) it was edited by Duncker and Schneidewin (Göttingen, 1856).—See Bunsen, "Hippolytus and his Age" (4 vols., London, 1852); Döllinger, *Hippolytus und Callistus, oder die Römische Kirche in der ersten Hälfte des dritten Jahrhunderts* (Ratisbon, 1853); Wordsworth, "St. Hippolytus and the Church of Rome in the 3d Century" (London, 1853); W. E. Taylor, "Hippolytus and the Christian Church of the 3d Century" (1853).

HIPPONAX, a Greek lyric poet who flourished in the latter half of the 6th century B. C. He was a native of Ephesus, was banished by its tyrants Athenagoras and Comas, and afterward lived in Clazomenæ in extreme poverty. He was small and ugly in person, and was one of the severest of Greek satirists. His favorite themes were the effeminacy and vices of his fellow citizens, and the faithlessness of women. The Chian sculptors Bupalus and Athenis, who made caricature statues of him, were assailed in the bitterest and most envenomed of his satires. Of the poems of Hipponax about 100 lines are still extant.

HIPPOPOTAMUS (Gr. *ἵππος*, horse, and *ποταμος*, river), a pachydermatous animal, inhabiting Africa. It is generally called sea cow by the Cape colonists, a term which is usually applied in America to the manatee. The dental formula is: 4 incisors in each jaw, long, cylindrical, pointed, and inclined forward below, short, conical, and curved above; canines 4, resembling the incisors of rodents, the upper ones straight, the lower thick and bent, overlapping the upper; the molars 6 on each side in each jaw, the anterior 3, more pointed, and the posterior with the points in the adult worn in a trefoil shape. Its powerful jaws, sub-cylindrical lower incisors, and chisel-edged canines, are formed principally for tearing and crushing rather than grinding the coarse tough plants and aquatic roots and grasses upon which it principally feeds; the canines seem excessively developed. In its skull it resembles the hog in the connection of the bones and their sutures, in other respects being more like the ox; the skeleton is very massive, indicating the great size and strength and rather slow locomotive powers of the animal. The skull is remarkable for the horizontal plane of its upper portion, the eyes, nostrils, and ears of the animal when in the water being nearly upon the same level, and the upper part of the head, when this alone

is visible, looking not unlike that of a horse; the bony orbits are very prominent, projecting above the top of the skull. The stomach is multiple, something as in ruminants, though it is not known to chew the cud; it can contain 5 or 6 bushels of vegetable matter, and the large intestine is about 8 inches in diameter; the intestinal canal, without cæcum, is nearly 12 times as long as the body, considerably more than 120 feet. The average length of the male from the end of the nose to the tip of the tail (the latter being about a foot) is 14 feet, but they have been known to measure 17 feet; the females are much smaller; the girth is nearly equal to the length, and the height at the shoulders between 5 and 6 feet; the aperture of the mouth is about 2 feet wide, and the tusks are more than a foot long. This huge unceuth body, of a form between that of an over-fed pig and a fattened ox, is supported on short stout limbs, with 4 toes on each small foot, nearly equal and with short hoofs; the massive head is broad, and the expression of the face singular from the high position of the eyes; the lips are wide and tumid, especially the upper, concealing the teeth when the mouth is shut, and furnished with a few tufts of hair; the nose is broad and truncated, and the nostrils, on the end and capable of protrusion so that the animal may breathe when all the body is under water, may be closed during submersion; the prominent eyes enjoy great freedom of motion, and may be protruded or retracted to adapt its vision to an air or water medium; the last two contrivances are admirably adapted for the protection of an aquatic animal so wary and sluggish as the hippopotamus. The head is contracted behind the angles of the mouth, and the forehead is broad and flat; the ears are only 3 or 4 inches long, fringed and lined internally with a fine hair, just behind and but little above the eyes; the eyebrows are tumid, which makes the eyes appear deeply seated; the neck is short, thick, and hog-like, the back slightly arched, the body cylindrical, the nates full, the pendent abdomen almost touching the ground, the tail short, robust, and edged with wiry hairs, the mammae two in number and ventral, and the skin nearly naked. The color, when the skin is dry, is reddish gray, brownish on the back, lighter beneath; under water the colors are various shades of blue. Prof. Owen, in the "Annals and Magazine of Natural History," vol. v., 1850, gives some additional particulars from a young living specimen received at the zoological gardens of London in 1850, the first seen alive in Europe since the time of the emperor Gordian III. in Rome in the 3d century. This animal was captured on the banks of the Nile in Aug. 1849, and was supposed to have been recently brought forth, as it was not much larger than a new-born calf, though stouter and shorter legged; it arrived in London in May, 1850, and was accordingly then about 10 months old, yet it was 7 feet long and of $6\frac{1}{2}$ feet girth in the middle of the body. The hind limb was buried in the skin of the flank nearly to the

prominence of the heel; there was no trace of a glandular orifice, as in the rhinoceros, behind each foot; the naked skin, of a dark India rubber color, and with fine transverse wrinkles, glistened with a sebaceous secretion as the animal emerged from the water; the eyes had a thick nictitating membrane, and the mouth a peculiar upward curve of its angles toward the eyes, which gave a comical expression to the massive countenance. Apparently in perfect health, it breathed 3 or 4 times in a minute, slowly and regularly; its food consisted of a kind of porridge of milk and maize meal, though it was more than half weaned from its baby diet. Several species are described by zoologists, but the best known and most extensively distributed is the *H. amphibius* (Linn.), which was formerly found from Egypt to the cape of Good Hope in all the large rivers, though now it is rare except in the lonely regions explored by Livingstone and Cumming. Of whatever species, they spend most of their time in the water, lolling about in a dreamy manner, frolicking like a porpoise, or wallowing in the mud like a hog; they leave the rivers chiefly at night to crop the soft succulent grasses on their banks, especially in localities where brushwood abounds; they are also fond of passing the day in the ocean, near the mouths of rivers. Though clumsy upon the land, their movements in the water are graceful and rapid; they are gregarious, and both sexes delight to congregate at all seasons of the year in small herds; they can remain under water for about 15 minutes, walking upon the bottom, and probably longer if necessary; but it is not known whether this ability to sustain prolonged immersion is owing to an apparatus like the venous reservoirs of the seals, the arterial plexiform receptacles of the whales, or some other equivalent structure. They are playful, peaceable, and inoffensive when undisturbed; but if wounded, and especially if in company with their young, they are savage and eager to assail any enemy; the males in the love season are quarrelsome, and both sexes are often seen covered with scars; it is said that the young males are often killed by the older ones. The males are darker colored than the females. The period of gestation is about 9 months, and a single young one is brought forth on land, taking to the water instantly when alarmed; the very young ones are carried in the water on the neck of the mother, and when they grow older on the withers; when they blow, they puff up the water about 3 feet high, according to Livingstone. The sagacity of the hippopotamus, though inferior to that of the elephant, is considerable, as evinced by its adroitness in avoiding its enemies on land or in the water, its escaping from pitfalls and other stratagems of the natives, its going with its young to distant localities when annoyed by man, and its caution in exposing itself even in its watery abode when it has been once assailed; the rifle of civilized man it is not prepared for, as the success of Gordon Cum-

ming in "bagging hippopotami" fully shows. They are hunted for their flesh, which resembles pork; for the *speck* or layer of fat just under the skin, a *bonne bouche* for the Cape Town epicure; for their teeth, which are valuable articles of trade, and were formerly much employed for their hardness in the manufacture of artificial teeth, and for various ornamental purposes; and for their tough skin, which is made into shields and helmets, and cut into cylindrical strips, which form the whips of the Cape colonists. The voice of the animal is between a grunt and a neigh, and has been compared by travellers to a variety of discordant sounds. Its voracity is very great, and its destruction of the native crops, both by devouring and treading them down, has been known and deplored from the earliest antiquity. Beside man, the principal enemy of the hippopotamus, and in its own element, is the crocodile; the ancients believed that an inextinguishable enmity existed between these animals, but both are so well armed and defended that they probably do not very often attack each other. This animal was well known to the ancients, and it figures under many shapes in their writings; accurate representations are given on Roman coins and Egyptian sculptures; it was occasionally seen in their triumphal pomps and gladiatorial shows. Since the time of Bochart the behemoth of the Hebrews has been supposed by many to be the hippopotamus, and some of the verses in the 40th chapter of Job well apply to this animal; some authors, however, Milton among the rest, deny that these animals are the same, without throwing any light upon what the behemoth really is.—For interesting details on the method of hunting these unwieldy creatures, see the 2d volume of Gordon Cumming's "Hunter's Life in Africa," and Anderson's "Lake Ngami, or Explorations and Discoveries during Four Years' Wanderings in the Wilds of S. W. Africa;" and for notices of their character and habits, Livingstone's "Travels and Researches in South Africa."—The hippopotamus is found fossil in the tertiary and diluvial formations of Europe and Asia.

HIRING. One may hire a person or a thing, and the thing hired may be real estate or personal chattels. For the law of hiring real estate, see *LEASE*. In this article we shall treat only of the hiring of persons, and of the hiring of chattels. In England the relation of master and servant is peculiar, and is perfectly recognized both by custom and by law, and it is governed by principles which apply to no other relation. In the United States it is not so. The word servant is often applied in the South to a slave, but in the free states it is seldom used. In New England the word "help" is common. It is derived from the earlier colonial times, when many immigrants paid for their passage by selling their service for a certain time. These were called bound or bond servants; and soon the word servants was applied to them alone, and those who were hired to render service in

the house, or on the farm, were called "help." The word is likely to be retained, because it expresses very accurately the relation between those who would be called master and servant in other countries. In this country this relation is simply one of contract—so much work for so much wages; and it is governed by the ordinary rules of the law of contract. If the servant be disobedient or negligent, it may be a good ground for withholding wages, or for discharge, according to circumstances; and if he does any injury he is responsible in damages; and this is all.—One question in regard to the rights of master and servant has been much agitated in the United States, and differently viewed by different courts. It is, whether and how far the ancient and somewhat technical principle of "entirety of contract" should be applied to this contract. If A promises B to do a certain thing, and B promises A to pay him therefor a certain sum, A has no right to do what part of this thing he chooses to do, and then compel B to pay him a proportional part; because B may want the whole thing, and only the whole thing, and has bargained for it. This is certainly a reasonable principle in itself, but it was formerly applied with a severity which did mischief. It was applied to the contract of master and servant, thus: If A agrees to work for B for one year at the rate of \$12 a month, and works 11 months and then leaves B without cause, B is under no obligation to pay him any thing for the 11 months' labor. This rule was universal and undoubted both in England and America until a few years since. Then it was questioned in New Hampshire; and the law was established for that state, that in such case the servant can recover nothing on the contract, but may recover whatever the service he has rendered is worth, deducting therefrom full compensation for any injury sustained by the master from the servant's breach of contract. This rule would seem to work justice to both parties. It has been adopted in Vermont, but expressly denied in Massachusetts; and the ancient rule must still be regarded as generally prevailing. If, however, the servant leave because of ill treatment, or is driven away, or is sick, or has any good cause for leaving, he may undoubtedly recover wages for the time he has served. The rule of entirety is applied also where a servant is hired for an indefinite time, but is paid quarterly or monthly; if he leave without cause in the course of a quarter or a month, he can have no wages for any part of it. On the other hand, a servant who is hired for a certain term, and is turned away before the time is up, without good cause, may tender his service for the whole period, and keep himself ready to render it, and can then recover for the whole period.—The question how far a master is responsible for the acts of his servant has been much considered in England and here, and is of great importance, especially in relation to railroad companies, and other corporations having numerous employees.

But this and some other connected questions may more conveniently be treated under the title *SERVANT*.—We will now pass to the hiring of a chattel. In one sense a ship is a chattel; but the hiring of a ship will be treated under *SHIPPING*. The contract of hiring a chattel is for the mutual benefit of the owner and the hirer; the hirer is therefore bound, not to extreme care, but to ordinary care, which is defined as that care which a man of ordinary capacity would take of his own property under ordinary circumstances; and he is responsible for any injury caused by a want of such care. This obligation varies with the thing hired; it is one degree of care with a costly watch or jewel, or a valuable horse, and another with coarser and cheaper things. The hirer is, in general, as responsible for the negligence of his servants about the thing hired as for his own. Whether he would be responsible for a wilful injury by his servant would depend somewhat on circumstances, and may not be certain from the authorities; but we should say, in general, that he would not be so responsible. It may be said that he is not responsible for injury caused by the theft, robbery, or violence of others, unless his own negligence or default caused or facilitated the wrong. If he sell the chattel or give it away, he can pass no title, and the owner may demand and take it from the receiver or from any buyer, even if he bought in honest ignorance of the owner's title, and paid full price for it. The obligations of the owner of a thing hired may be stated thus: he must deliver it in good condition for the intended and agreed or customary use, and keep it in good order, or pay the hirer his reasonable expense for so keeping it, as for example a carriage and horses hired for a journey; he must not interfere with the hirer's lawful and reasonable use of it; but if the hirer make of it a use which he has no right to make, the owner may peaceably repossess himself of it, or have his appropriate action; and if the hirer refuse it, the owner may recover damages, although he repossess himself of the thing. The right and obligations of the hirer may be thus stated: he may use it in the intended and agreed or customary way, and must not use it in any other way; he must not abuse or injure it in any way, must surrender it at the time agreed upon, or if no time be agreed on, then whenever, within a reasonable time, it is demanded by the owner; and he is bound to pay the agreed price, or if none was agreed, a customary and reasonable price. Nearly all, or indeed all, these particulars are open to the agreement of the parties, if they choose to provide expressly for them.—The contract of hiring may be terminated by the expiration of the agreed period, or the performance of the agreed use; or by any agreement of both parties; or by the act of either party at a reasonable time; or by the purchase of the thing hired by the hirer; or by the destruction of the thing hired. It may be added as a general remark, that either party to this

contract, who inflicts an injury upon the other, may be made responsible in damages.

IIRPINI, an ancient people of Italy, of Samnite race, who dwelt in the southern part of Samnium, W. of Apulia, N. of Lucania, and E. of Campania. At the time of the 2d Punic war they were independent of the Samnites. They took up arms against Rome during the social war. Their chief places were *Æculanum* and *Aquilonia*. (See *SAMNITES*.)

IIRST, *HENRY B.*, an American poet, born in Philadelphia, Aug. 23, 1813. He was admitted to the bar of his native city in 1843, his youth having been spent in the study of law, frequently interrupted by the duties of mercantile life. Previous to his examination he published in "Graham's Magazine" several poems which became very popular. His first volume was "The Coming of the Mammoth, the Funeral of Time, and other Poems" (Boston, 1845). "Endymion, a Tale of Greece" (Philadelphia, 1848), is regarded as his best production.

IIRTIUS, *AULUS*, a Roman statesman, born about 90 B. C., fell in battle near *Mutina* (Modena) in 43 B. C. He was a friend of Julius Cæsar, under whom he served as legate in Gaul (58), and one of the 10 prætors nominated by him for the year 46. In 44 he received Belgic Gaul as his province, but governing it through a deputy, he remained in the capital in continued intimacy with Cæsar, who nominated him, together with *Vibius Pansa*, as consul for the next year. After Cæsar's assassination he retired to the country. Though not fully recovered from a dangerous illness, and politically undecided, he entered upon his duties as consul, Jan. 1, 43. He finally declared against Antony, and was sent at the head of an army to join *Octavianus*, and relieve *Decius Brutus*, then besieged by Antony in *Mutina*. He fell while leading his victorious troops to an assault on the camp of Antony. The authorship of the 8th book of the *Commentaries* of Cæsar on the Gallic wars, as well as of the history of his Alexandrian, African, and Spanish campaigns, was attributed to *Hirtius*, but also claimed for *Oppius*. The matter was doubtful as early as the time of *Suetonius*, and has since not been decided.

IISPANIA. See *SPAIN*.

IISPANIOLA. See *HATTI*.

HISTILÆA, or *OREUS*, an ancient city of Eubœa, on the river *Callas*, at the foot of Mt. *Telethrium*. It ranked among the oldest and most important of the Eubœan cities. Occupied by the Persians after the battle of *Artemisium* (480 B. C.), it afterward successively became subject to the Athenians (who, in consequence of a revolt in 445 B. C., displaced its inhabitants for Attic colonists, and changed its name to *Oreus*) and to the Spartans. During the wars of Alexander's successors, and those of the Romans and Macedonians, *Oreus*, because of its position and strength, was a place of great importance.

HISTOLOGY (Gr. *istos*, a web or texture, and *logos*, discourse), the science which classifies and describes the elements of structure as

existing in the solids and fluids of living bodies. The development or origin and transformations of the elementary organized forms, termed histogeny, is usually included. The parts of a living, especially of an animal body, are, almost without exception, highly complex in structure. A mucous membrane, for example, consists, first, of one or more layers of cells on its free surface; next, of the basement membrane; lastly, of a thick, fibrous coat, mainly composed of simple fibres, and containing also capillary vessels, lymphatics, and nerves, usually a few muscular fibres, and in particular situations others of the simpler forms of structure. But simple white fibres, nervous filaments, and capillary vessels are found, in varying quantities, in every organ of the body; so that it has been well said that, if without disturbing either one of these all other textures could be imagined completely dissected away from it, the perfect form of the body and of its organs would in each case still be preserved. Especially is this true in respect to the simple white fibre, which in more or less close interlacement extends through and between all the organs, forming a sort of warp within which the other elementary forms are disposed, and known as the connective or areolar tissue. Such elementary forms, which organized matter takes, and which, like the builder's materials, are then made to enter into the construction of the various organs, are termed tissues. These are also distinguished as the simple tissues; the compound, as the muscular or the osseous tissue, closely approach or become identical with organs. Thus, histology is a sort of general minute anatomy; and since the elements of tissue are mainly to be discovered by the microscope, it is a subdivision of microscopic anatomy. Histology is, in the broadest sense, divisible into physiological and pathological; also, into general and special, the former investigating the elements in general aspects only, the latter in regard to their distribution in special organs; and again, into vegetable and animal, the latter of these being further subdivided into comparative and human histology.—The general structures in the human body may be considered in 2 classes: elements of tissue, and compound, or tissues proper; but a third class may be introduced before the last of these, the fluids containing histological elements. There are 3 true elements: 1, homogeneous substance, composed of and resembling mere solidified albumen, filling the spaces between cells and fibres in certain organs, and possessing only the lowest vital properties; 2, simple membrane, a thin, transparent film, usually without observable structure, the office of which is first of all limitary, since it is never penetrated by the other forms, but separates them, and which, as in the wall of cells, possesses active powers of osmose, and hence of absorption, secretion, and excretion; 3, simple fibre, white and yellow, forming two tissues, and entering into others, and also appearing in the clot of the several nutritive fluids; and 4, the cell, a derivative from one of these, with

granules. The fluids containing elements of tissue, or the substance of these, are in a general sense of 2 kinds: nutritive fluids, as blood, chyle, and lymph, and the secretions and exudations. In the tissues proper, the gradations and combinations of the elementary forms are so various, that great difficulty lies in the way of a simple and at the same time practically useful classification; and considerable diversity on this point appears in the works of different authorities. Carpenter considers the tissues under the 7 convenient classes of simple fibrous, fibro-cellular membranes, purely cellular, sclerous, tubular, muscular, and nervous. Prof. Peaslee, approximating nearer to the actual organs, enumerates 17 classes, some of which have subdivisions. In the article ANATOMY, the date of the modern and true histology is given, together with some of its generalizations. It may here be stated that among these the following are specially important: that all possible tissues originate within an organism starting in a single cell; that the materials of most of the tissues have first passed through successive elaborations by one or more classes of cells; and that the larger number of them result directly from multiplication of cells, ordinary or transformed. Virchow, in his recent work, claims also that a cell can only arise from a preëxisting cell, never *de novo*; and that, indeed, no other tissue can thus originate from the supposed blastema, or plastic exudation, of the older pathologists. In this view, therefore, since the creation of the first pair, the race has been kept up by, and every physiological and pathological phenomenon has had its origin in, the division and multiplication of cells—the difference between physiology and pathology being only that of normal or morbid action in similar organized forms.—After Schleiden and Schwann, conspicuous among those who by their discoveries have enriched the science of histology, may be named Barry, Wagner, Bischoff, H. Müller, Paget, Goodsir, Purkinje, Remak, Todd and Bowman, Luschka, Burnett, Hassal, Henle, Wedl, Lebert, Kölliker, Virchow, and Jacobowitch. In the United States the taste for histological research seems not yet to have become prominent. Histology has led to revision and material advancement of pathological theories, while it has almost wholly recast the science of physiology. It has quite changed the conception of certain diseases, as cancers, explained the production of others, as dropsies, and introduced into the family of morbid diatheses certain new members, prominent among which is the leucocythæmia, or white-cell blood, of Bennett. The latest of these is probably the amyloid or starchy degeneration, by unusual development of cellulose within the tissues, discovered by Virchow, and found to affect especially the nervous system, spleen, liver, kidneys, and the female reproductive organs. For a clear and condensed statement of the present condition of the science, see Peaslee's "Human Histology" (8vo., Philadelphia, 1857).

HISTORY (Gr. *ιστορεω*, to inquire, and to narrate), as a department of knowledge, the sum of human events; as a department of literature, the whole body of the narratives of such events. Lord Bacon in his classification of learning assigns to history every thing that is related immediately to the memory; it would thus include all the particular facts and events that are known by the senses, as distinguished from philosophy, which is the sum of the general and necessary truths that are known by the reason, and from poetry, which treats the realm of the imagination. In this wide sense the term natural history is used, comprehending the facts of the animal, vegetable, and mineral kingdoms. In its more definite and scientific meaning, however, history includes only the actions of mankind, or of a portion of it, as developed by intellectual and morally conscious races, nations, parties, and individuals, and excludes the phenomena of unconscious nature, except in their connection with the vicissitudes and actions of man. The object of history is, therefore, consciously acting man. It treats the whole domain in which his will is potent and his mind creative, and has to do with nature only in so far as it influences his fortunes or is affected by his energy. Yet historical science does not notice all the separate acts of single men, which are the elements of biography, but grasps single acts and men only in their relation to some society. Dr. Arnold, therefore, defines history to be "the biography of a society." The society may be a family, a corporation, a state, several states united by a common policy, religion, race, or civilization, or it may be the whole world; and, in its broadest and absolute meaning, history is the biography of mankind. But of all societies, the state is that which acts most prominently and constantly in directing human affairs. All other social forces, religions, commercial, or literary, and all ideas, arts, sciences, and usages, are easily considered as concentrating in it; and history is, therefore, most frequently conceived with reference to the destinies of states—to the acts of governments, and the acts that influence governments—and comprehends the biographies of nations. I. The historical records of Egypt are older than those of any other state, with perhaps the exception of China, reaching back to its foundation by Menes (2412 B. C., or according to Lepsius 3,893 B. C.). Yet the Egyptians were not the most ancient of mankind, but were probably an offshoot from a primeval Asiatic stock, whose antiquity and achievements are unknown. Egypt may boast one of the longest national periods known in history, extending from its foundation to 525 B. C., when, conquered by Cambyses, it became a Persian province. Twenty-six dynasties reigned over it in 3 successive capitals, This, Memphis, and Thebes. For nearly 20 centuries (according to the chronology of Lepsius) the nation scarcely ventured from the valley of the Nile; there was then a foreign conquest by mysterious invaders, the

shepherd kings, whose dominion lasted about 5 centuries; then a war of independence; after which, for about 2 centuries (1500–1300), Egypt was by its arts and its arms the first nation in the world. The boundaries of the new empire of the Pharaohs were advanced into Ethiopia, Libya, and far into Asia. Above all other peoples the Egyptians are distinguished for the care and toil with which they constructed great and imperishable monuments of their existence, confirming the statement of Diodorus that "they held the time of their life very short, but that after their death very long." Their still enduring pyramids, temples, palaces, obelisks, and mummies bespeak the immense efforts of the oldest of nations for a perpetual name. In the period of Egyptian supremacy and culmination civilized states had already arisen by its side. Babylon, in 1500 B. C. the rival of Thebes in science and art, was the second great centre of civilization, and the capital of a vast Chaldean empire. For several centuries (1300–700) Semitic culture and arms held the first rank in Asia. Pressed at once by the Pharaohs and the Hebrews, the occupants of the Phœnician coasts threw themselves upon the sea, and founded the first great naval and commercial power. In 1000 B. C. they had traversed the whole length of the Mediterranean, planting cities on its islands and coasts, and had brought iron and amber from the shores of the North sea and the Baltic; they had extended their commerce E. to the mouth of the Indus, N. to the regions of the Caucasus, and S. to the land of frankincense in Arabia. Meantime on the upper Tigris arose Assyria, the first martial and conquering kingdom of ancient Asia, which lasted for about 5 centuries, till the fall of Nineveh under Sardanapalus (640 B. C.). Babylon yielded to its arms, and under its most warlike princes it was dominant in western Asia from the Mediterranean and the Halys on the one hand to the Caspian and the great Persian desert on the other. Its civilization is believed to have been hardly surpassed by that of any other ancient country, and its material arts and appliances did not fall immeasurably behind the boasted achievements of the moderns. Between the commercial and the warlike power, between Tyre and Sidon on the west and Nineveh on the east, was the scene of Hebrew development. It was about 1300 B. C. (Lepsius) that the Hebrews passed from Egypt into southern Syria, sword in hand, and conquered their position. Beset by the commercial activity and sensual worship of the Phœnicians, oppressed and carried captive by Assyrian and Babylonian conquerors, they only grasped with the greater purity and intensity their idea of Jehovah, which lies at the basis of the theistic conceptions of the leading modern nations. Semitic splendor and dominance passed away in the 7th century B. C., destined however to rise again after a thousand years in Arabia. It was only in league with the Aryan (Indo-European) stock that Nabopolassar had been

able to overthrow Assyria and to revive Babylon, and it was this stock that now succeeded to the supremacy. In a period far beyond the reach of documentary records the Aryan nations, the most prominent actors in history, began to migrate westward and southward from a centre beyond the Indus. It is demonstrated by comparative philology that in ante-historical time the ancestors of the Celts, the Germans, the Slavi, the Greeks and Italians, the Persians, and the Hindoos dwelt together in a common home. Migrating to the west, they established the empire of the Medes and Persians, which threw off the long Assyrian dominance, extended its sway from the Hindoo Koosh to the Italy, and in the 6th century gave an Aryan supremacy to western Asia. Subordinate to it were Lydia, which had been master of the western half of Asia Minor, Babylon, which had a second time risen to power, and its dependencies, and finally old Egypt; and for the first time Egyptian and Bactrian, Syrian and Armenian, Lydian and Median Asia were united into one vast whole. The world had before witnessed no such empire as that of Cyrus. Migrating to the south, the Aryans came into contact with a widespread dark-colored race, the aboriginal inhabitants of the trans-Himalayan countries, at a time when China was the principal state in the further Orient. According to Lassen, the first historical period of India is the Vedic era (2200–1100 B. C.), the records of which are contained in the sacred books called Vedas, during which the Aryans pushed themselves to the Ganges, contended with the original inhabitants, and subdued them to a servile caste. The termination of these heroic contests (in the 14th century B. C.) forms in Hindoo chronology the beginning of the present world period of Kali. During the liturgical era (1100–600 B. C.), the first repose of the Aryans in India, the Vedas were collected and the liturgy was fixed. Undisturbed by foreign commotions, the Hindoos became, as they have always been, quiet, passive, and meditative, pondering on refinements of thought, but indisposed for real action and struggle. While the Indo-European tribes in the West have successively reappeared at the head of human affairs and have controlled the tumults of history, those in the East, absorbed in the struggles of thought, have neglected the present to find in the past only the problem of creation and in the future only the problem of destiny. Brahminism had been established, a wonderful world peopled with transmigrating souls had been invented by the fancy of the Brahmins, philosophical schools had made their appearance, ethics was resolving itself into the rights and duties of castes, and religion into an endless ceremonial and changeless ritual, into a wild throng of gods on the one hand and into almost unintelligible metaphysical ideas on the other, when a powerful impulse was given to eastern life by Buddhism, whose founder Buddha was probably nearly contemporary with Confucius in China and Cyrus in Persia.—The scene of civ-

ilization was now transferred from Asia to Europe, and Persia found its stoutest opponent, its superior in culture, and finally its conqueror, in Greece. The first wave of population that passed westward from Asia was doubtless Scythic or Turanian, but among the earliest were the Pelasgic tribes, who peopled Greece and Italy, of whom the Hellenes, or Greeks proper, soon took the lead, presenting the highest type of character and development. As early as 1500 B. C. several Greek cities had according to the popular belief been founded; the heroic age and mythical achievements closed perhaps near the age of Solomon (1000 B. C.); and there is a dim history till with the Persian war began the period of Greek supremacy. The various tribes had then raised themselves to separate and peculiar political systems—monarchical, aristocratical, and democratical—and the Athenians, Lacedæmonians, Thebans, and Macedonians were successively predominant. The best Hellenic energies were exhausted in the great Peloponnesian civil war between Sparta and Athens, the representatives respectively of the opposed Doric and Ionian races, for the hegemonic position (*ἡγεμονία*) in the general policy of Greece. Then followed the short dominion of the Thebans under Epaminondas, after which the Macedonians became lords of the ascendant and ruled for a time with despotic sway. The reaction against the Persian attack on Greece was the irruption of Alexander the Great into Asia, who with something of an oriental spirit, with Asiatic enthusiasm and impetuosity, sought to transcend the ordinary boundaries of Hellenic civilization and modes of thought, and to be a monarch at once of Greeks and barbarians. The Hellenico-Asiatic monarchy of the Seleucidæ and the Hellenico-Egyptian of the Ptolemies were the most powerful of the kingdoms formed from the fragments of his empire. Greece subsequently enjoyed an apparent freedom under the protection of Rome, but in 146 B. C., after the destruction of Corinth with innumerable masterpieces of ancient art, it was reduced to permanent vassalage under Roman prefects and legions. Probably the greatest facts in the history of the Greeks, to which preëminently must be attributed the mighty part which they have played in the civilization of mankind, were their poetry and their monuments of the plastic arts. More potent and permanent in influence than their republican states, than the fleeting example of Grecian liberty, than the universal empire of Macedon, even than their long dominant schools of philosophy, have been their mythology and harmonious conceptions of humanity, embodied in poems and sculptures which still contribute much to the intellectual refinement of Christendom. The whole culture and spirit of the Greeks finally became exclusive. Though in the time of Homer they had regarded with wonder the wealth and wisdom of Sidon and Egypt, their national pride and superiority soon made them esteem every thing foreign as barbarous; and, complete in themselves, disbelieving in any extraneous

excellence, they sought only the highest attainments within the confined but brilliant sphere of their own imagination.—In contrast with the variety in states, races, political constitutions, and intellectual tendencies which endured in Greek society, the history of Italy shows how all the primitive nations that settled in the country were at length absorbed by one great central city and moulded into a unity of character. From this city sprang an almost universal monarchy, Rome being always regarded not merely as the centre but as the personification and essence of the empire. From its origin the Roman state was hardly more than an organized school of war, systematically invading and making conquest of the neighboring nations. After subduing the cities of Italy, the Romans' first became prominent in the history of the world in their warfare with Pyrrhus, king of Epirus, and in the long doubtful contest with Carthage. The first great reaction against their career of conquest was the Achaean league, which terminated in the destruction of Corinth, as unsuccessfully as the preceding wars of resistance. The most formidable enemy of the Roman republic from the time of Hannibal was Mithridates, king of Pontus, whose lofty but futile aim it was to unite in one armed confederacy all the nations of the north from the regions of Mt. Caucasus as far as Gaul and the Alps. The proper circle of Roman dominion, embracing the countries bordering on the Mediterranean, was completed by Caesar and Pompey—by the latter on the side of Asia, and by the former over the more warlike nations of the north-west. Civil conflicts raged successively between the Gracchi and the patricians, between Marius and Sylla, between Caesar and Pompey, between Brutus and Cassius and Antony and Octavianus, terminating at length in the establishment of the empire and of general peace under Octavianus, who assumed the name of Augustus. The duration of the Roman republic was 479 years (510–31 B. C.). The most enduring influence of Rome has been through its codes of law and the example of its organized and splendid dominion. Its scientific jurisprudence triumphed over the crude barbaric systems, and was silently or studiously transfused into the domestic institutions of Europe; and after the empire had fallen, the city not only remained the seat of the papacy, but the highest pretension of mediæval Frank and German emperors was to be the successors of Augustus, and therefore the heirs of the kingdom of the world and of the prerogatives of Roman emperors over their subjects.—The vast empire of the Caesars, having become degenerate and demoralized, threatened to fall into general stagnation, into a Chinese civilization, with stationary arts and sciences, and life reduced to ceremony and routine. Two great revolutions saved western Europe from this disaster. The first was the triumph of Christianity over paganism, by which a new spirit, the peculiar genius of a higher and more active civilization than that of the

classic nations, was introduced into society. Yet this remedy was not violent enough for the disease, and did not prevent the Byzantine or eastern branch of the divided Roman empire from falling into a polished and luxurious state of stupefaction, in which the intellect was for centuries tortured but not advanced by tumults and controversies, and in which no great discovery was made in science and no book was written that holds rank in literature. The countries of the western empire escaped from this fortune by the invasions of the northern barbarians. The troubled period of transition in which new nationalities with new ideas and institutions struggled into existence on the ruins of the Roman empire is termed the middle ages. Whatever precise limits be assigned them, they lasted for about 1,000 years, extending, as most generally reckoned, from the close of the imperial line with Augustulus in A. D. 476 to the discovery of America in 1492. After the fall of the western empire Europe presented a scene of infinite confusion. Of the many new barbarian governments that were formed, most soon went to ruin; and only the kingdoms of the Ostrogoths and the Lombards, and the empires of the Franks and the Germans, which arose successively, maintained a comparatively permanent dominance. The monarchy of the Franks attained the summit of its strength and splendor under Charlemagne, who was crowned by the pope, on Christmas eve, 800, Augustus and emperor of the Romans. His empire, which embraced Muslims in Spain, half-converted pagans in Saxony, pagan Avars on the Danube, and Christian Germans and Franks jealous of each other, while Scandinavians, Slavi, and Saracens gathered along its frontiers, suddenly went to pieces after his death. The feudal system then gave birth to a powerful hereditary aristocracy, which disputed alike the royal authority and popular liberty. In the 10th century the empire of the Franks was succeeded by that of the Germans in the primacy of Europe, Otto the Great receiving the imperial dignity in 961 after it had been suspended for nearly 40 years. Then began the long contest between the popes and the emperors, the Guelph and Ghibelline parties, the holy Roman church and the holy Roman empire (Germany), each claiming the supremacy, until under Innocent III. (1198–1216) “the pope was the sun and the emperor was the moon.” During the 13th century, Rome held an almost absolute sway. The earlier migrations are connected with the crusades by the movements of the Normans, who, after settling in the finest province of France, conquered England and made an important element in the composite English nation, and with romantic valor established the kingdom of the Two Sicilies in the south, and meditated even the overthrow of the eastern empire. The crusades, prompted by religious enthusiasm and the romantic spirit of chivalry, failed in their main object, the permanent recovery of the holy sepulchre from the Saracens. They contributed,

however, to exalt the power of the pope, who appeared as the originator of the plans which temporal sovereigns were called upon to execute; to promote the growth of cities and the power of burghers by the absence of the nobles; to give prosperity and importance to Venice, Genoa, and other free commercial cities of Italy; and to originate the religious orders of knighthood, and thus to consolidate an aristocracy. The knights hospitallers and knights templars, enriched by large estates, and embracing many of the higher nobility and clergy, were powerful alike in war and peace; and the Teutonic order became master of the territory of the half-civilized horde of Prussians, and held in the 14th century the entire coast of the Baltic from Dantzic to Narva, though often in war for its possession with the neighboring state of Poland. At length in the 15th century Europe began to present an established political system, a federal community of states united by a common religion and by ties of international law. With widely different institutions and tendencies, yet with a balance of political power and of moral and intellectual influence, with a connection between its parts close enough to favor rivalry and mutual improvement, yet not close enough to destroy the idioms of national opinion and feeling, Europe displayed a Hellenic variety and activity in political affairs, and was prepared to assume a new importance in the records of universal history. But at the close of the middle ages the relative power of the papacy had already somewhat declined, the monarchs were as yet nowhere absolute, being limited both by the aristocracy and the cities, and the third estate was everywhere rising into importance.—The countries of the Orient had no middle ages, in the sense which the term bears in Europe. From the beginning of their history China and India have for the most part followed a separate and secluded course, and till the last century were hardly related to the affairs of the West except through the middle term of Mohammedan and Tartar invasions. Within the first century from the hegira (622) the Moslem conquerors had passed from the Arabian peninsula over Persia, Syria, Egypt, and thence along northern Africa, past the pillars of Hercules, and even beyond the Pyrénées, their progress in that direction being finally checked by Charles Martel (732). In the 8th century the caliphs of Bagdad were rivalled only by Charlemagne in power, and their courts patronized letters and the sciences, and were famed for a degree of culture then unknown in Europe. Their sudden decline was caused not so much by the separation and independence of the caliphs of Cordova and afterward of those of Africa, as by an influx of successive hordes of Tartars like the barbarian invasions upon imperial Rome. Across the north-eastern frontier of their empire came the Seljookian Turks in the 11th century, who conquered Persia, embraced the religion of the vanquished, left to the caliph-

ate of Bagdad only a phantom of sovereignty, and threatened Constantinople. As early as the 4th century the Tartars had founded a dynasty in China, and now from Persia the Turks invaded and made conquests in India. The Moguls, or Mongols, another Tartar horde, under Genghis Khan overran China in the 13th century, and under his sons they overwhelmed Persia, prostrated the Russian monarchy, and like the Huns and Magyars in previous centuries terrified the furthest nations of Europe, penetrating as far as the Oder (1241), but retired before the emperor Frederic II. Another irruption followed under Tamerlane, who, making little progress in Europe, extended his empire from the heart of India to the *Ægean*, and defeated at Angora the sultan of the Ottoman Turks (1402). This was the last Tartar migration westward, but in 1644 the Manchoo Tartars founded the present dynasty of China. The Mogul empire was established in India by Baber, a descendant of Tamerlane, about 1526, and attained its highest power from the reign of Akbar the Great to Aurungzebe (1556–1707), at whose death it fell to pieces. The Ottoman power revived, extinguished the Byzantine empire by the conquest of Constantinople (1453), and established a Turkish nationality in Europe. The eastern gate of Christendom fell before the Moslem conquerors, as Spain had fallen in the 8th century, but the Hungarian John Hunyady and the Albanian Scanderbeg renewed the exploit of Charles Martel and stayed their progress.—The conquest of Constantinople, whence many learned Greeks escaped to the West, the changes wrought in the art of war by the use of gunpowder, the invention of printing, the revival of learning, the discovery of America and of the passage to the East around the cape of Good Hope, and the Protestant reformation, are the great events which ushered in modern European history. Until the treaty of Westphalia (1648) Europe was chiefly engaged in maintaining or opposing Roman Catholicism. The result was a rapid and decisive triumph of Protestantism in the northern parts of Europe, attaining its highest ascendancy within 50 years from the time when Luther burned the bull of Pope Leo (1520). Meantime a reformation of manners and discipline had been carried on in the south, a reaction of Catholic zeal had taken place, and from the genius and enthusiasm of Loyola had sprung the order of the Jesuits. Between the Catholic governments of the south and the Protestant governments of the north lay the doubtful territory of France, Belgium, southern Germany, Hungary, and Poland, and the result of the long struggle on this battle field was the victory of the church of Rome. At the peace of Westphalia no part of Europe remained to Protestantism which had not already been acquired during the generation that succeeded Luther. The first prominent political change in modern Europe was the triumph of despotism. The royal authority, extended by Ferdinand the

Catholic, Louis XI., and the English Tudors, was made absolute on the continent by Philip II., Richelieu, Louis XIV., and others; and the attempt of the Stuart dynasty to enlarge its prerogatives in England was defeated only by civil war and revolution. In the European confederacy of states monarchies predominated; and though a few republics were tolerated, ranging in character from the severe aristocracy of Venice to the pure democracy of some of the Swiss cantons, no one of them, with the exception of the Dutch republic, attained any considerable degree of power. The political system rested upon the principle of the balance of power, and as often as any nation has risen to such predominance as to threaten to destroy the political equilibrium if not to attain universal dominion, it has been strenuously and successfully resisted by its neighbors. The first that did this was the Austro-Spanish power in the 16th century under Charles V., heir at once of Ferdinand the Catholic, who had consolidated the states of Spain into one great nation, destroying also the last remnants of Moorish power in that country, and of Maximilian I., to whom the German empire owed its more perfect organization. The extent of his dominions was dangerous to the political balance, and the house of Hapsburg, which in 1526 acquired also the crowns of Hungary and Bohemia, was believed to aim at a hegemonic authority in Europe. This aim was resisted principally by France, by Francis I. throughout his reign and by the alliance of Henry II. with the Protestants of Germany in 1551, and was frustrated by the abdication of Charles V. and the consequent division of his empire in 1555-'6. The Spanish monarchy, however, supported by the wealth of the new world, remained an object of alarm under Philip II., especially as France was then distracted by religious wars; but its power was reduced by the revolt of the provinces forming the Dutch republic, by the opposition of England under Elizabeth, and by the return of France to her due importance in Europe at the close of the religious wars under Henry of Navarre. Again the house of Austria, under its two heads the emperor and the king of Spain, was regarded as dangerously dominant from the conquest of the Palatinate in 1622. A coalition was formed against it, at the head of which were the first statesman and the first warrior of the age, Richelieu and Gustavus Adolphus, Sweden now playing a leading part in general European affairs. The result was that by the peace of Westphalia (1648) the Austrian power was effectually restrained, and by that of the Pyrenées (1659) Spain retired for ever from the foremost place which it had been wont to hold. France under Louis XIV. succeeded Spain and Austria in assuming predominance in Europe. It made formidable territorial conquests, its navy was powerful on the seas, its internal resources were developed, and its supremacy was recognized in art, fashion, and literature. The main resistance now came from England under

William III., from the military achievements of Marlborough and Eugene; and the peace of Utrecht (1713) annulled all danger of French domination. The long war which simultaneously took place in the N. E. was decided by the defeat of Charles XII. of Sweden at Pultowa (1709), and the subsequent successes of Russia. For 90 years no European power excited strongly the jealousy of its neighbors, Frederic the Great of Prussia, whose genius fitted him to be a conqueror, having been too limited in physical resources, and England, whose great naval and colonial successes had begun to excite alarm, receiving a check from the loss of her finest colonies in America. The dismemberment of Poland by its three neighbors, though virtually resulting only in the growth of the Russian power, was received indifferently in western Europe. Then began the French revolutionary period, the crisis in modern history, in which the whole fabric of European institutions, political, social, and religious, was threatened with destruction. A splendid court and a humiliated people had been the two elements in the military-monarchical style of government which had been fully inaugurated by Louis XIV. The wall of partition which had thus been established between the nobility and the citizens was broken down by the intellectual culture of the 18th century, when polite literature became common to both classes, and alike valued by both. Great writers swayed the age, while the nobility clung to their exclusive prerogatives and the cabinets to their wonted policy. Thus ancient abuses and new theories flourished together. Beneath the shadow and the grievances of the monarchy, the popular intellect rose to extreme boldness and activity. Every system was studied and doubted, every theory was grasped and refuted, every institute of life was speculatively remodelled, and vast schemes for the reorganization of mankind were mooted. Culture, however, assumed the impracticable character of illuminism, the great discussions were carried on in part by men who neither knew nor cared any thing of any department of affairs, and the inevitable collision between grievous institutions and ideal doctrines was therefore long delayed. The state was content if it could as a matter of fact continue to govern oppressively, and the people indemnified themselves for oppression by denying or ridiculing every principle on which the state reposed. At length the great revolution, often predicted, arrived near the last decade of the century. Impelled by ideas of liberty and equality, partly imported from America and partly the creation of the leading writers of the age, prominent among whom was Jean Jacques Rousseau, the French overthrew their government, were immediately attacked by Austria and Prussia, proclaimed a republic, virtually declared war against the powers of Europe by promising "fraternity and assistance to all people who wished to recover their liberty," executed the king and queen and made terror the order of the day at home, and undertook a warfare of 20 years,

the most gigantic in its scale that has ever agitated the world, in which France conquered almost every continental capital, and only her ancient enemy England was able to persistently oppose her, but which terminated after Waterloo with a union of Englishmen and Cossacks in the French metropolis. Though the French accepted the absolutism of Napoleon, and though he sought to ally his revolutionary dynasty with the ancient dynasties of Europe, yet this period may be regarded as the heroic age of civil liberty on the continent, in which free political tendencies were implanted which no subsequent governments have been able wholly to suppress. The holy alliance which followed was a monarchical coalition for the restoration of the general political system on the principle of legitimacy. On the decisions of the congress of Vienna, which aimed at the readjustment of the territorial relations, distracted by conquests, on the principle of the balance of power, the equilibrium of Europe has rested almost to the present time. France, reduced nearly to the limits of 1790, Russia, aggrandized by the possession of all Finland, the greatest part of Poland, and part of Moldavia, Austria, acquiring from dismembered Italy the Lombardo-Venetian provinces, Prussia, exalted to prime rank by obtaining one half of Saxony and a part of the duchy of Warsaw, and Great Britain, whose territory had been unimpaired in the storms of war, became the 5 great powers, which from that time have practically and diplomatically formed an aristocracy in the European political system. Germany became a confederation instead of an elective empire. Absolute monarchies, constitutional monarchies, and republics, as those of Switzerland and of the 7 Ionian islands, have since then worked together in Europe without any general war. Under the restoration the French government joined the holy alliance, and was the agent of the congress of sovereigns at Verona in reëstablishing absolutism over attempted constitutionalism in Spain (1823). The part which it took in the liberation of Greece and its successes in Algeria failed to relieve the popular discontent. Twice the idea which animated the first revolution, the desire for representative institutions, has reappeared in Europe in new revolutionary eras. The first was in 1830, when France changed its dynasty, and adopted a constitution in which the sovereignty of the people was distinctly recognized, when Belgium successfully revolted from the kingdom of the Netherlands which had been established by the congress of Vienna, when the abrogation of the Salic law prepared for revolutionary dynasties of queens in Spain and Portugal, and when an insurrection broke out in Warsaw only to result in the extinction of the last remnant of Polish nationality. A little later, England by the passage of the reform bill transferred the predominance in its government from the territorial aristocracy to the middle class, from the house of lords to the house of commons. The government of Louis Philippe,

like that of the restored Bourbons, failed to satisfy the liberalists in France, and again in 1848 from Paris as a centre began the march of revolution. A republic was proclaimed in France, Italy expelled most of its sovereigns, the bureaucratic governments at Berlin and Vienna were overturned, and Hungary revolted from Austria. Austria, however, was saved by its army, but was able to subdue the Magyars only by calling in the aid of Russia. A reaction soon began in France, which resulted in the acceptance by the nation of the military despotism of Louis Napoleon in order to have political and social security and the glory of national strength. From the time when Russia transferred its seat of empire from Moscow to St. Petersburg, turning its glance from the East westward, it has advanced with apparent unity of purpose to an unsurpassed influence in European politics. Its encroachments in the east of Europe, seeking a pathway to Constantinople, which has long been the capital of a decaying empire, were the occasion of a war waged against it by Great Britain, France, and Turkey (1854-'6). The last European war between Austria and allied France and Sardinia (1859) resulted in the transference of Lombardy from the first to the last of these powers.—The predominance of Europe in modern history appears from the extent of its colonies. The Portuguese, the Spaniards, the Dutch, and the English succeeded each other during the last 3 centuries as the leading colonial powers. The French also began to plant colonies under Colbert, but have not rivalled the successes of the English. The result of colonial enterprise was that about the middle of the last century European dominion was spread over nearly all of America, one half of Asia, and the coasts of Africa and Australia. From these great possessions several independent nations have since arisen, yet at the present time the governments of Europe (whose population is 272,000,000) are estimated to have 220,000,000 foreign subjects in every part of the world, in Asia, Africa, America, and the isles of the sea. Europe thus governs at home and abroad nearly one half the estimated population of the globe. Of the colonies which have won their independence and become nations, the most remarkable is the United States of America, the first great example of a purely democratic government. No other state affords a parallel to its rapid and unbroken progress, no other having ever been so highly favored by circumstances. Originally colonized by adventurous or religious persons from the most civilized nations of Europe, it had no long period of barbarism to outgrow, and no native population to be absorbed or reduced to a caste. The aborigines only retreated and disappeared before the invaders. Achieving its independence while the political theories of the 18th century were in vain seeking a lodgment in Europe, it was able at once to realize free institutions, unhampered by old traditions and usages. Its commercial enterprise and pros-

perity, territorial and numerical increase, and the diffusion of some degree of culture throughout the community, are among its most patent historical aspects. Other colonies which became independent in the first third of this century, most of them adopting a republican government, are Hayti, the Argentine confederation, Paraguay, Chili, Colombia (divided in 1831 into 3 republics, Venezuela, New Granada, and Ecuador), Peru (from which Bolivia separated in 1825), Uruguay, the 5 United States of Central America (dissolved in 1839), Brazil, and Mexico.—The histories of particular nations are treated in the articles under their names. The following are the most important universal histories: "Universal History from the Earliest Account of Time to the Present, compiled from Original Authors" (26 vols., London, 1736-'65, last ed., 60 vols., London, 1779-'84; translated into French, 46 vols., Amsterdam, 1742-'92; with modifications, 126 vols., Paris, 1779-'91; translated into German, 66 vols., 1774-1814, to which 6 supplementary vols. were added); William Guthrie and John Gray, "General History of the World" (12 vols., London, 1764-'7); De Lisle de Sales, *Histoire des hommes* (41 vols., Paris, 1781); Clément and other Benedictines of St. Maur, *L'art de vérifier les dates* (3 vols., 1783-'7; continued by Fortia d'Urban and others, 36 vols., Paris, 1818-'44); Anquetil, *Abbrégé de l'histoire universelle* (12 vols., Paris, 1801-'7); Dillon, *Histoire universelle* (10 vols., Paris, 1814-'21); Ségur, *Histoire universelle* (44 vols., Paris, 1817 *et seq.*); Becker, *Weltgeschichte* (9 vols., Berlin, 1801-'5; continued by Woltmann, Menzel, and Lobell, 14 vols., 1836-'8; 15th vol. by Arnd, 1855); Johannes von Müller, *Vierundzwanzig Bücher allgemeiner Geschichte* (3 vols., Tübingen, 1810); Rotteck, *Allgemeine Geschichte* (9 vols., Freiburg, 1813-'27; continued by Steger, 10 vols., 1853); Schlosser, *Weltgeschichte* (9 vols., Frankfurt, 1817-'24); Leo, *Lehrbuch der Universalgeschichte* (6 vols., Halle, 1835-'44); and Cesare Cantù, *Storia universale* (35 vols., Turin, 1837-'42; 7th ed. 1842). The most important general histories of antiquity are: Sir Walter Raleigh, "History of the World" (London, 1614; completed only to 167 B. C.); Rawlinson, translation of Herodotus, with annotations and dissertations (4 vols., London, 1853-'60); Rollin, *Histoire ancienne* (12 vols., Paris, 1730 *et seq.*); Niebuhr, *Alte Geschichte* (3 vols., Berlin, 1847-'51), and other works; and Duncker, *Geschichte des Alterthums* (4 vols., Berlin, 1852-'7). The most important works relating to mediæval history are: Gibbon, "Decline and Fall of the Roman Empire" (6 vols., London, 1776-'88); Hallam, "View of the State of Europe in the Middle Ages" (2 vols., London, 1818); Keppen, the "World in the Middle Ages" (2 vols., with maps, New York, 1856); Schmitz, "History of the Middle Ages" (London, 1859 *et seq.*); Frontin, *Annales du moyen âge jusqu'à la mort de Charlemagne* (8 vols., Paris, 1825); Luden, *Allgemeine Geschichte der Völker und Staaten des Mittelalters* (Jena, 1821-'2); Hüllmann, *Das*

Städtewesen des Mittelalters (4 vols., Bonn, 1802-'9); and Kortum, *Geschichte des Mittelalters* (2 vols., Bern, 1836-'7). Among the more important general histories of later periods are: Schöll, *Cours d'histoire des états Européens depuis la chute de l'empire Romain jusqu'en 1789* (46 vols., Paris, 1830-'36); Russell, "Modern Europe" (5 vols., London, 1779-'84, continued to 1856 by Jones); Schlosser, *Geschichte des achtzehnten Jahrhunderts* (2 vols., Heidelberg, 1823; 4th enlarged ed., 1853 *et seq.*); Alison, "History of Europe from the Commencement of the French Revolution to the Accession of Louis Napoleon" (in 2 series, Edinburgh, 1833-'59); and Gervinus, *Geschichte des neunzehnten Jahrhunderts* (Berlin, 1855 *et seq.*). The most important histories of the Protestant reformation are those of Burnet, D'Aubigné, Marheineke, Ranke, and Dollinger. To the Lutheran "Magdeburg Centuries" (1559-'74) were opposed the Catholic "Ecclesiastical Annals" of Baronius (1588-1607). More general church histories are those of Milner, Henry, Potter, Matter, Mosheim, Schröckh, Semler, Spittler, Henke, Gieseler, Neander, Hase, Guericke, Kurtz, Stolberg, Katerkamp, Locherer, and Ritter, and the comprehensive "History of the Church of Christ, in Chronological Tables," presenting a synchronistic view of the events, characteristics, and culture of each period, by Henry B. Smith, D.D. (New York, 1859). Among the principal histories of civilization are those of Guizot, *Histoire générale de la civilisation en Europe* (Paris, 1828-'30); Wachsmuth, *Allgemeine Culturgeschichte* (Leipsic, 1850-'52); and Buckle, "History of Civilization in England" (1st vol., London, 1857). II. The multitudinous sources of written history may be generally classified as traditions, monuments, memorials, testimony, and observation. Traditions include the myths and legends which anticipate the annals of every people, which retain their identity and something of their original historical significance after being transplanted by migrations and transformed by poetry, and which therefore aid in illustrating the genius, kindred, and early movements of tribes and races. The traditions of every ancient nation begin with cosmogonical, mythological, and poetical conceptions of the era of the creation of the universe. Monuments include all relics of the past not specially designed to be commemorative, but which, surviving their age, bear down to posterity with themselves some knowledge of events. Such are the ruins of cities, and all antiquities, as habiliments, utensils, weapons, sculptures, medals, and coins. In this class may be reckoned the philological and ethnological sources, which are of the highest importance in modern researches, by which relationship and migrations are inferred from comparison of the roots of languages and of physiological characteristics. Memorials include inscriptions on pillars, tablets, medals, and coins; legal and diplomatic documents, which are original authorities as to facts; private correspondence, which, being ul-

timately made public or laid before the historian, often reveals secret transactions and throws light on personal motives and character; the newspapers, which constitute a perpetual record of first impressions, and show the manifold phases and constant conflicts of public opinion; contemporary statements of facts, howsoever published and preserved; and the more elaborate writings properly called histories. Testimony and observation are the sources of the historian who lives near the events which he records. In earlier periods, when the conduct of affairs was in the hands of a comparatively few persons, and when there were few writings or recondite sources of information, contemporary histories have been written that have maintained their eminence as artistic and authoritative productions. If the writer were, like Cæsar, the leading actor, or, like Comines, an intimate associate of the leading actors, he had all the information that was accessible in his own time, and more than would survive his generation. But in recent times, when every public event immediately occupies thousands of pens, when every slight and private occurrence leaves its record behind it in friendly epistles, when every important movement is preceded by preliminary conversations and correspondence that are yet matters of unpublished biography, when historical societies collect and treasure vast stores of details, and when the matter written daily in the English and French or English and German languages on contemporary events probably exceeds in quantity our whole inheritance of Greek and Roman literature, it is alike impossible for the historian to have before him all the sources for the history of his age, or to conceive and arrange with artistic skill the multitudes of facts which perplex his imagination if not his reason. The picture is too near the eye to be seen except in parts, and its grander features and general relations appear only as it becomes distant. The great modern historical works are, therefore, with scarce an exception, histories of the past. The essential allies of history are chronology and geography, which define the theatre of events in time and space. The principal methods of arrangement are the synchronistic, grouping together all the occurrences of a particular age, and the ethnographical, recounting separately the fortunes of a particular nation. Historical writings vary in compass from a single era, nation, or event, to universality, and in character from a table of statistics to profound views of polity, religion, science, art, and popular morality—from a naïve, thoughtless description of a patent fact, to conceptions of final causes, of the law of events, and of the philosophy of history. The requisites in the historian are a habit of severe veracity, a constitutional delight in recalling and dwelling upon the past, and intellectual endowments which shall enable him to reproduce and present the course of events at once to the reason and the imagination. "A perfect historian," says Macaulay, "must pos-

sess an imagination sufficiently powerful to make his narrative affecting and picturesque. Yet he must control it so absolutely as to content himself with the materials which he finds, and to refrain from supplying deficiencies by additions of his own. He must be a profound and ingenious reasoner; yet he must possess sufficient self-command to abstain from casting his facts in the mould of his hypotheses. Those who can justly estimate these almost insuperable difficulties will not think it strange that every writer should have failed, either in the narrative or in the speculative department of history. . . . To be a really great historian is perhaps the rarest of intellectual distinctions. Many scientific works are in their kind absolutely perfect. There are poems which we should be inclined to designate as faultless, or as disfigured only by blemishes which pass unnoticed in the general blaze of excellence. There are speeches, some speeches of Demosthenes particularly, in which it would be impossible to alter a word without altering it for the worse. But we are acquainted with no history which approaches to our notion of what a history ought to be; with no history which does not widely depart, either on the right hand or on the left, from the exact line."—From the earliest times the East had its annals and chronicles. The Egyptian sculptured lists of kings, with names, dates, and explanatory inscriptions, extend back into the fourth decade of centuries B. C., the remotest point yet reached by historical inquiry. The annals of the state were written by the priests, with mythical exaggerations. From the monuments and sacred writings Manetho, high priest at Heliopolis (about 280 B. C.), wrote in Greek a history of Egypt, of which there remains only a list of the dynasties with a few fragments. The kingdoms of Babylon, Assyria, and Persia also had sculptured registers of their kings, with records of their military expeditions, of treaties, and of the tributes paid by provinces. Of the Babylonian empire, Berosus, a priest of Belus (about 276 B. C.), wrote a Greek history of which considerable fragments remain. The ancient sculptures, bearing in cuneiform inscriptions the history of the regions of the Euphrates and the Tigris, have recently been brought to light; and the effort to interpret them, as well as to decipher the hieroglyphics of Egypt, is now a principal object of learned research, and has already rescued long eras of national existence from the domain of myth and fable. In China, in every age and under every dynasty, histories have been carefully written under the patronage of government. They form an important part of the voluminous Chinese literature, and secure to the Chinese that minute and familiar knowledge of their own country for which they are as remarkable as for their ignorance of other countries. Examples of their large collections are the *Shu-king*, compiled from ancient records by Confucius, a history of China from 2357 to 770 B. C.; and the *Wen-kian thung-khao*, a complete geographical, his-

torical, and statistical cyclopædia of a period of 40 centuries, written in the 14th century by Ma-tuan-lin. Rich and interesting as was the ancient literature of the Hindoos, blossoming into an original and peculiar drama, they have applied themselves little to historical writing, being in this respect the reverse of the Egyptians and the Chinese. They seem to be almost incapable of strict historical conception and statement, and habitually treat the most common facts in a fanciful style and with colossal extravagance. Their mythological chronology, in which 12,000 years is one of the minor numbers, is an example of their early historical notions, which lie quite out of the domain of history. The Greek historians before Herodotus—Cadmus of Phereus, Acesilaus of Argos, Hecateus of Miletus, Pherecydes of Leros, Charon of Lampascus, Hellanicus of Mytilene, Xanthus of Sardis, and Dionysius of Miletus—are termed logographers, and all lived in the century preceding him. It is remarkable that a nation so practical and intellectual as the Greeks should have reached nearly the height of its political development before requiring a correct record of its transactions in war and peace. The reason is that until the Persian war the real Hellenic history could not rival in interest the great exploits of the mythical period, did not possess the charms with which the imagination had decked the heroic age. It was only when Greece came into contact with the ancient monarchies of the East, and assumed its place among the mighty nations of the earth, that its historical events rose to a dignity comparable to that of its poetical mythology. And, doubtless, from the lateness of the period when Hellenic literary art descended from the ideal representation of gods and heroes to portraits of real men, it gave to the latter a nobleness and beauty of outline which it would not otherwise have attained. The mythical era was the favorite subject of the logographers, though some of them passed to contemporary affairs. Their style was rude and spiritless, and they never aimed beyond a matter-of-fact record of whatever they had learned. The first who attempted by ingenious arrangement and beauty of style to produce an impression similar to that made by poetry, and who may therefore be said to have invented a sort of new art, was Herodotus, the father of history. His work, after nearly 25 centuries, is still the finest example of romantic history, narrating with child-like interest and with a faultless taste the marvels of a splendid but little known Orient, and the great conflict in which the heroism of Greece defeated the wealth and power of Persian despotism, and from which dates the political and intellectual supremacy of Europe. The Persian war was succeeded by the Peloponnesian contest between the belligerent republics for the hegemonic power in Greece, which became the theme of Thucydides. The impending interests of the conflict completed the intellectual revolution of the nation from mythical visions to

practical affairs, from poetry to oratory, from the wild sublimity of Æschylus to the rhetorical discussions of Enripides, from the naïve and wondrous narrative of Herodotus to the skillful condensation and criticism of Thucydides, who arranged his materials according to general ideas and a sagacious conception of causes. A concise and pregnant style, giving rapidity of description, a strict regard to a unity of action aiming at the establishment of Athenian domination, and a sort of forensic cast occasioned by the free use of public speeches as sources, and by the practice, borrowed from Herodotus, of developing opposite views, passions, and interests in speeches which he puts into the mouths of his characters, have preserved to his work an eminent place among reflective histories and intellectual performances. Xenophon rivalled his two predecessors in his extensive intercourse with the world, in general culture, and in purity of style, but not in dignity and force of thought. His history of the retreat of the 10,000, of which he was the leader, and of Grecian affairs from the close of the narrative of Thucydides, are best characterized as pleasant reading. The style of the historians who succeeded these 3 masters, as Ephorus, Theopompus, and Philistus, was corrupted by the influence of the rhetorical school of Isocrates. With the extinction of proper Hellenic politics by Philip of Macedon, and the change of scene wrought by the conquests of Alexander, two new tendencies appeared. The antiquaries, or writers of the *Atticides* (Attic histories), of whom Clitodemus and Philochorus were the most eminent, treated the myths, legends, worship, art, manners, and customs of antiquity, drawing their materials not from the poets, but from monuments, inscriptions, and tablets. At the same time numerous rhetoricians and scholars, as Anaximenes, Callisthenes, Clitarchus, Nearchus, and Ptolemy Soter, recounted with fantastic exaggerations the exploits of Alexander the Great, assuming a declamatory tone, and distorting the truth for rhetorical effect. Timæus, the historian of Greece and Sicily, was also a representative of this Asiatic style of eloquence. In avowed antagonism to this school, Polybius (204–122 B. C.) described the period in which Rome triumphed over Greece, boasting of his matter-of-fact style, and producing the driest and least entertaining, though one of the most instructive of Greek histories. The same treatment prevailed in the universal history of Diodorus Siculus, in the geographical summary of Strabo, and in the more artistic Roman history of Dionysius of Halicarnassus, but in the first century A. D. was abandoned by Plutarch, who sought to raise the standard of public morality by recalling the great memories of the past, and in whose biographies the old poetical spirit of Hellenic historiography was revived. His principal successors, in all of whom the evil influence of the reigning sophistry and rhetoric is apparent, were Arrian, the imitator of Xenophon, the ethnographer Appian, Dion Cassius, whose mo-

del was Thucydides, the antiquary Pausanias, and Herodian, the last Greek historical writer worthy of mention before the Byzantine period. The Byzantine historians include a long series of authors on the affairs of the state and the church for more than 1,000 years, no one of whom is esteemed for literary merit, or departed from the circle of ideas which constituted the theology and the policy of the court.—The oldest historical records of Rome were the official and legal documents preserved in temples and holy places. The *Annales Pontificum*, called also *Annales Maximi*, originated in the registration by magistrates of the most important events of each year, and formed 80 books when they were discontinued in the time of the Gracchi. The metrical chronicles of Nævius and Ennius preceded the lost *Origines* of the elder Cato, the first Latin history and the first important work of Latin prose. The compilation from the official annals by Scævola (133 B. C.), and the autobiographical memoirs of the consuls Scæurus, Rufus, and Catulus, and of the dictator Sylla, were surpassed in literary merit by Sisenna's history of his own times (70 B. C.). In the following century the historical art rapidly advanced with the general progress of Rome, and three masters in their respective manners, Cæsar, Sallust, and Livy, appeared. Cæsar's narratives of his campaigns in Gaul and of the civil war between him and Pompey are models of a pure, concise, and, as it may be called, soldierly style. Sallust is elaborately rhetorical, excelling in characterization, and perhaps the finest Roman historical painter. The most splendid example of an elaborate Roman history is that of Livy, admirable for its rhetorical vividness and grace, harmonious grouping, warmth of feeling, and that exuberance of thought and language which the critics called *lactea ubertas*. To exalt the dignity of his country, and to produce striking picturesque effects, were his two leading aims, in which he happily succeeded, and the real truth was to him a comparatively indifferent matter. In the first century, under the imperial despotism, histories of the court, of parties, of wars, collections of anecdotes, compendiums, discussions, and biographies abounded. Here belong the intellectual and lively Paternulus, one of the best representatives of the silver Latinity, the anecdote collector Valerius Maximus, the rhetorician Quintus Curtius (the first Latin historian of the expedition of Alexander the Great), the court biographer Suetonius, the florid Annæus Florus, and Tacitus, the greatest of Roman historians. The natural moral earnestness and dignity of Tacitus assumed a character of lonely pride and pathetic introspection under the declining empire, and the fundamental thought of his narrative is the prevalence of moral and political degeneracy. With no hope for the restoration of popular or imperial virtue, witnessing with fatalistic, stoical, and melancholy composure the disorganized state, subject alternately to the tyranny of its rulers and the vices of its soldiers,

his style of thought became intensely subjective, and he has hardly been surpassed by any writer in profound knowledge and minute delineation of character. From the 2d century the most important works on Roman history were written by Greeks in their own language. In a wilderness of names of Latin historians in the 2d and 3d centuries, the most important are the *Scriptores Historiæ Augustæ*, embracing imperial biographies from Hadrian to Diocletian (117–284). Short and simple summaries began to appear in the 4th century, as text books for pupils; such were the compendiums of Aurelius Victor, Eutropius, and Sextus Rufus. The last important history in Roman literature was by Ammianus Marcellinus (390). Two Christian writers, the Gallic presbyter Sulpicius Severus and the Spanish presbyter Paulus Orosius, may be mentioned as forming the point of transition from classical to mediæval historiography. With Cassiodorus, the minister of Theodoric, and Jordanes, Gregory of Tours, and Bede, the historians respectively of the Goths, Franks, and Anglo-Saxons, was ushered in the era of chronicles, the type of history peculiar to the middle ages. Every country, and every considerable city and convent in Europe had its special chroniclers, who often made their subject the end and aim of universal history. Mingling the driest annals with poetical hyperboles, they are rarely esteemed either for style or thought, and become authorities only by cumulative evidence.—Meantime more important works were written in the East. Of Arab historians, Orwa ibn Sobeir (died A. D. 711) wrote of the religious wars under Mohammed and his early successors; Abu Giaffar Mohammed ibn Dshoreir Faberi of Amol (923), a universal chronicle, of which Elmascinus largely availed himself; Emad-Eddin of Ispahan (1201), a chronicle of the Seljooks in Persia; Boha-Eddin ibn Sheddad (1234), a full but ill-digested biography of Saladin; Elmascinus of Egypt (1273), a learned history of the Arabs from the oldest times; Abulfeda of Damascus (1331), many learned works on Mohammedan history; Ibn Khaldim of Tunis (1405) introduced philosophical reflections on Arabian society, culture, industry, and arts; Arabshah of Damascus (1450) narrated in poetical style, and with passionate hatred of his hero, the exploits of Tamerlane; and Dshala-Eddin Abderrahman compiled a highly esteemed history of the caliphs to the year 1498. Among the earliest Persian historians are Ala-Eddin Dshowaini (1275), the chronologist Beidahlwi, and Wassak (1310), the biographer of Genghis Khan. Mirkhond (1498) compiled a valuable history of the prophets, kings, and caliphs, from old oriental traditions. Older than either of these, and of scarcely less authority after it leaves the mythical era, is the great Persian historical poem, the *Shah Nameh* of Firdusi (1020). The best and one of the latest of the chroniclers, Froissart (1410), the romantic narrator of the age of chivalry, may be styled the Herodotus of modern historiography. About a

century later appeared the *Mémoires* of Comines, sententious, diplomatic, and anecdotal, the first example of a style which has been especially popular in France, and the *Discorsi sopra Livio* of Machiavelli, who sought in the ancient world the materials to illustrate the events of his own time, and was thus the first writer of what may be called comparative history. From this time historiography assumes its place as a leading department of literature, and has employed an amount of genius, erudition, and literary skill which make it the rival of poetry and philosophy in dignity, interest, and importance. Its various phases and developments and its best achievements are treated in this work in the accounts, given in special articles and in the articles on the literatures of different nations, of the greatest modern historians; as: in English—Raleigh, Clarendon, Burnet, Hume, Robertson, Gibbon, Mitford, Thirlwall, Grote, Finlay, Turner, Lingard, Arnold, Mackintosh, Hallam, Milman, Alison, Carlyle, Mahon, Macaulay, Froude, Merivale, Irving, Bancroft, Prescott, Hildreth, and Motley; in French—Daniel, De Thou (Latin), Sully, Bossuet, Rapin, Vertot, Montesquieu, Voltaire, Raynal, Ancillon, Lacretelle, Sismondi, Lamartine, Guizot, Barante, Mignet, Thiers, Michelet, Thierry, Louis Blanc, Martin, and Ségur; in German—Moscow, Büna, Möser, Dohm, Schiller, Schröck, Schlözer, Johannes von Müller, Eichhorn, Niebuhr, Rotteck, Heeren, Hammer-Purgstall, Zschokke, Schlosser, Lappenberg, Ramm, Ranke, O. Müller, Dahlmann, Döllinger, Gfrörer, Woltmann, Beck, Bülow, Gervinus, Menzel, Neander, Savigny, Lüdén, Pertz, Droysen, Bunsen, Duncker, Wachsmuth, Scherr, Klemm, Waitz, Mommsen, Häusser, and Zöpfl; in Italian—Malespini, Giovanni Villani, Machiavelli, Guicciardini, Bembo, Varchi, Sarpi, Davila, Bentivoglio, Giannone, Muratori, Maffei, Colletta, Botta, Cesare Cantù, Gualterio, and Ranalli; in Spanish—Hernando del Pulgar, Sepúlveda, Mendoza, Ocampo, Morales, Melo, Herrera, De Solís, Muñoz, Capmany, Ferreras, Quintana, Navarrete, and Torreno; in Portuguese—Albuquerque, Castanheda, De Goes, Bernardo de Brito, Luiz de Souza, Andrade, and Correa de Serra; in Swedish—Geijer, Fryxell, Strinnholm, and Renterdahl; in Danish—Holberg, P. E. Müller, Petersen, Pontoppidan (Latin), and Grundtvig; in Dutch—Hooft, Hugo Grotius (Latin), Wagenaar, Van Kampen, Bilderdijk, Wijn, and Groen van Prinsterer; in Russian—Karamsin, Bolshovitinoff, Ushakoff, Pogodin, and Mihailovski-Danilevski; in Polish—Naruszewicz, Niemcewicz, Lelewel, Bandtke, Maciejowski, Lukaszewicz, and Chodakowski; in Hungarian—Horváth, Teleky, Prónay, and Toldy; and in modern Greek, Philemon and Tricoupis.—Among the best works on the art of historical writing are Lucian, *Ἦτος δὲ ἱστορίας συγγραφῆν*; Wachler, *Geschichte der historischen Forschung und Kunst seit der Wiederherstellung der literarischen Cultur in Europa* (2 vols., Göttingen, 1812–20); Tittmann, *Ueber Erkenntniss und Kunst der Geschichte*

(Dresden, 1817); Creuzer, *Die historische Kunst der Griechen* (2d ed., Leipsic, 1845); Wachsmuth, *Entwurf einer Theorie der Geschichte* (Halle, 1820); W. von Humboldt, *Ueber die Aufgabe des Geschichtsschreibers* (Berlin, 1822); Duncker, *De Historia ejusque Tractanda Varia Ratione* (Berlin, 1834); Gervinus, *Grundzüge der Historik* (Leipsic, 1837); Roscher, *Klio* (Göttingen, 1842); Vietz, *Das Studium der allgemeinen Geschichte* (Prague, 1844); Trächsel, *Ueber das Wesen und Gesetz der Geschichte* (Bern, 1857); Mably, *De la manière d'écrire l'histoire* (Paris, 1782); Châteaubriand, preface to his *Études historiques* (Paris, 1831); Daunon, *Cours d'études historiques* (20 vols., Paris, 1842 et seq.); Bolingbroke, "Letters on the Study and Use of History" (London, 1751). III. The philosophy of history seeks the law of human events, the ideal formula which rules all the forms of human effort and attainment, the principle whose development creates nations and civilizations, the forces and the direction of the forces which move the world onward to its destiny. It rises above any partial generalizations, such as theories of government, legislation, or political economy; above special views of nations and races, such as that the mission of Greece was to exemplify the beautiful and that of Rome to organize the state, that the Semitic races originate religions and the Indo-European sciences, that the Celtic races incline to monarchy and Catholicism and the Teutonic to representative institutions and Protestantism; and it grasps at final causes and universal relations. A veritable philosophy of history does not stop short of a theodicea. That the world is constituted and presided over by divine wisdom, and that a moral order prevails in the fortunes of men and nations, has been the general faith of mankind, appearing alike in the philosophies and poetry of the noblest nations. Bunsen sublimely expresses this thought in his definition of universal history as "that most sacred epic or dramatic poem, of which God is the poet, humanity the hero, and the historian the philosophical interpreter." The Hellenic conception of a divine Nemesis, the Hebrew faith that the divine principles of their national life should expand through the social and political institutions of all nations, ultimately making this earth the kingdom of God, and the confidence of the patristic and mediæval churchmen, who, having all hope in a world to come and little in that in which they lived, were obliged to flee to eternity to justify the ways of God with man, were all premonitions of the philosophy of history. The first formal attempt to reduce universal history to law was the *Discours* of Bossuet (1681), in which, epicizing the catechism, he bound the destinies of mankind to Judaism and Roman Catholicism, and with his vast teleological genius explained the march of events as the secret workings of Providence. Taking the Bible as a chart and ecclesiastical affairs as the central highway of history, he ranged all nations, ideas, and revolutions under

the banner of an uninterrupted hierarchy, and produced a system rather than a philosophy. The theory of Bossuet has been applied with greater erudition by later church historians, and appears in the treatment of mythology by Görres, Gladstone, and others, who trace the most significant myths and fables of various nations, either as offshoots or counterfeits, to the original Hebrew and Christian revelation, which was received in its purity by the church, the great central fact in the organism of history. The Bible thus furnished to Bossuet a theosophical solution of the problem of history. The first who supposed that history bore within itself the elements for its own solution, which might be discovered by a profound knowledge of man and the earth, nations and countries, and therefore the founder of the philosophy of history in its proper sense, was Vico, in his *Scienza nuova* (1725). He styled his new science "a civil theology of Divine Providence," aimed at a historical demonstration of Providence *a posteriori*, and affirmed that the organic development of great epochs furnished a stronger proof of moral government, and a brighter manifestation of order, justice, and progress, than could be supplied by any argument *a priori*. Stating first the essential elements of the common nature of man, and then the various phases which they assume in different nations and successive ages, he sought to describe the ideal circle in which the real world revolves. Every nation recommences with the same nature as its predecessors nearly the same series of revolutions, develops nearly the same faculties, and having completed nearly the same circle is extinguished by the same providential decrees. It is this universal rotation, these *corsi e ricorsi*, which has given to Vico's theory the name of the system of historical returns. His chief merit lies in his fundamental idea, the application of which is intermingled with unhistorical fables and unphilosophical fancies. Law and government, Greece and Rome assume an exaggerated prominence in his work, while religion, the Orient, and mediæval and modern Europe are slighted. His conclusions, too, are not ultimate. He stops with the existence of nations, their common nature, and their circular march, and does not grasp the *ensemble* of history, humanity itself. What becomes of the race amid these turns and returns? Does it advance, attaining from each new epoch a higher idea, a truer tendency? Are its revolutions the steps in a grand march? Does it follow, as Goethe fancied, a spiral line? If its development be progressive, what are the conditions of its progress, and to what destiny does it lead? These questions, which suggest the goal at which Bossuet ventured, were avoided by Vico. The system of Vico was revived and modified into a mystical doctrine by Ballanche in his *Palingénésie sociale* (1827), in which decay and rehabilitation are exalted into the two grand dogmas not only of history but of psychology. Every individual and every nation revolves toward its perfection

through 3 degrees—trial, initiation, expiation. Prometheus stole the sacred fire from heaven, was initiated into the secret of the gods, expiated his temerity in torments; mankind as represented in Adam yielded to temptation, was initiated into a knowledge of good and evil, was redeemed by the expiation of Christ. In such beliefs, which he everywhere finds in popular songs and traditions, containing the 3 elements of a trial to undergo, an enigma to divine, and a sacrifice to be offered, he traces the universal law of human life, which applies alike to the individual, the nation, and the race. Herder in his "Ideas on the Philosophy of the History of Mankind" (1784-'91) approaches the subject in a poetic spirit. With reverence of the soul and admiration of nature, he epicizes the antagonism between the two, and conceives of history as the triumph of the human spirit over the universe which enchains it, of the infinite over the finite. In the rise and fall of nations he sees only new steps and postures of the pilgrim spirit of humanity, ever passing onward from its old seats in which nature had thrown over it her mysterious toils, ever seeking higher attainments of civilization, yet ever an exile and a prisoner in this world, belonging by its nature and its destiny to another realm. Climate and geography play leading parts in his explanations, and with comprehensive view he aims to link the vicissitudes of history with the whole body of the universe, and to show that all the phenomena of humanity are in relation with the entire domain of nature, of which they constitute a special department. He thus exalts the share of external nature in history, making it create peculiar ideas and developments in peculiar localities. As his theory is professedly not established upon metaphysical categories, but upon breadth of culture and an instinctive felicity in detecting the influences of scenery and the peculiarities of nations, it forms a theodæa of the heart and the understanding rather than of the reason. The author appears in it less as a philosopher than as a comprehensive and imaginative thinker, a poetical and genial theologian, and an entranced admirer of the works of God. In Friedrich von Schlegel's "Philosophy of History" (1829), the fundamental idea is a lament that there should be a history at all. Man, he maintains, was created free, with a power of choice between a career among unhistorical blessed spirits, who live in free obedience to the divine will, and a course downward to the abyss of antagonism with God. He chose the latter, and history is a narrative of his return from this apostasy, a recital of the developments by which he is to recover his original state. It begins with a primitive revelation, and ends with the last judgment. The means of rehabilitation is the church, which is the kingdom of God planted on the earth. Some nations wandered completely away from the revealed knowledge, others retained traces of it, the Hebrews preserved it in its purity. Christianity came to infuse new energy into it, to spread it over the

earth, to introduce in its triumph a universal rehabilitation. But the genius of evil sowed the seed of revolt even in the bosom of the Christian church. The individualism, rationalism, and free inquiry of the Protestant centuries are an inspiration of Antichrist. The insurrectionary movement which impelled the Ghibellines and the reformers reached its climax in the French revolution; from which time begins a reaction in favor of submission to positive religion, and to the triple authority of father, priest, and king. The absolute dominion of these 3 vicars of the Deity is the end of history. Then the infinite plant of humanity will have resumed its normal state, and individual life will be a pure and divine vegetation. Hegel's "Philosophy of History" (1822-'37) presented the subject for the first time in connection with a system of thought logically elaborated to its minutest details. His fundamental principle is: *Was wirklich ist, ist vernünftig*. "Whatever exists, exists by process of reason." Reason is at once the infinite material and the infinite formative power of history. History is the objective development of the divine idea of the reason, whose essential characteristic is freedom, and the condition of whose existence is to know itself, to become self-conscious. At the foundation of every considerable aggregate of nations, of every important stadium of history, lies some characteristic idea, some phase and grade of the progressive development of reason. To realize these grades, to pass these moments of transition, and to arrive at a full consciousness of itself as the eternal truth and the absolute reality, is the boundless impulse of the world-spirit, the goal of its restless striving. Three stages and states of development mark this historic effort. The first is the oriental world, the realm of faith, obedience, and despotism, where gorgeous empires are constituted with all rational ordinances and arrangements, but in such a way that one individual alone, the sovereign, is conscious of freedom, realizes the idea of the spirit, and all the others revolve around him only as substances and accidents. The second is the Greek and Roman world, with its aristocracy, democracy, and slavery, in which some know their freedom, and individualities are formed; presenting in Greece the free individual conditioned only by beauty, the idea joyously and harmoniously expressing itself in matter and creating art; presenting in Rome the free individual in conflict with the abstract universality of the state. The third is the Christian, German, or modern world, in which all know their freedom, in which the idea seeks for harmony in itself, in the inner life of the individual, and, by being purified and elevated into universality, exalts him into a divine personality. Thus the empire of spirit is inaugurated. The long and painful efforts of modern history are required to establish its reign. The renaissance was the dawn, the reformation the morning, and the French revolution the midday of this last period in the progress of the idea toward its goal, when it

shall know itself as all truth and contain within itself all the history and results of the natural and intellectual universe. The absolute idea manifests itself not under national forms, but in the three domains of art, religion, and philosophy. —The most important works on the philosophy of history are those which have been mentioned, of Vico, Herder, Schlegel, and Hegel. See also Rosenkranz, *Was die Deutschen gethan haben für die Philosophie der Geschichte*; Gutzkow, *Zur Philosophie der Geschichte* (Hamburg, 1836); Roux-Lavergne, *La philosophie catholique de l'histoire* (1850); and Bunsen, "Outlines of the Philosophy of Universal History" (2 vols., London, 1854).

HITCHCOCK, EDWARD, D.D., LL.D., an American clergyman and geologist, born in Deerfield, Mass., May 24, 1793. He was principal of the academy in his native place from 1815 to 1818; pastor of the Congregational church in Conway, Mass., from 1821 to 1825; professor of chemistry and natural history in Amherst college from 1825 to 1845; president of Amherst college and professor of natural theology and geology from 1845 to 1854; and at the age of 66 still fills (1860) his favorite professorship. He was appointed state geologist of Massachusetts in 1830, of the first district of New York in 1836, and of Vermont in 1857. He was for several years a member of the Massachusetts board of agriculture, and was solicited to become secretary of the board. In 1850 he was commissioned by the government of his native state to examine the agricultural schools in Europe. The son of poor parents, and enjoying very limited means of early schooling, he educated himself and attained to his present position by his own exertions. His life has been in a great measure identified with the history of Amherst college. Connected with it almost from the beginning, and struggling with it under the pecuniary embarrassments which nearly crushed it during the administration of his predecessor, in his own presidency of 10 years he procured for it buildings, apparatus, and funds to the amount of \$100,000, doubled the number of students, and established it on a solid pecuniary as well as literary and scientific basis. He began his career as an author by the preparation of an almanac, which he conducted for 4 years (1815-'18), and the publication of a tragedy, the "Downfall of Bonaparte" (1815). He has since published more than 20 volumes, beside numerous sermons, addresses, tracts, and articles in the scientific and literary journals. His earliest scientific publications were the "Geology of the Connecticut Valley" (1823), and a "Catalogue of the Plants within Twenty Miles of Amherst" (1829). He next became particularly interested in the cause of temperance, and in the course of 2 or 3 years published a prize essay on the "Wine Question," an "Argument for early Temperance" (reprinted in London), and "Dyspepsia Forestalled and Resisted" (1831), afterward enlarged and reprinted under the title of "Lectures on Diet, Regimen, and

Employment." To the same class, though of a later date (1850), belongs the "History of a Zoological Temperance Convention in Central Africa," a volume illustrating the author's fancy, wit, and humor. In the sphere of practical religion may be mentioned "A Wreath for the Tomb" (1839), "Lectures on the Peculiar Phenomena of the Four Seasons" (1850), and "Memoir of Mary Lyon" (1851). In his favorite science, his successive "Reports on the Geology of Massachusetts" (1833-'5-'8-'41), published by the state, and "Illustrations of Surface Geology" (1857), published by the Smithsonian institution, are invaluable repositories of facts; while the "Elementary Geology," which has passed through 25 editions in America, and one third of that number in England, has received the public recognition as a standard text book. But the department in which Dr. Hitchcock has gained the greatest celebrity as a writer is that of natural theology, and especially the connection between geology and religion. His "Religion of Geology and its connected Sciences" (1851) was issued in two simultaneous editions in London, and has had a very wide circulation on both sides of the Atlantic. Dr. Hitchcock suggested as well as executed the geological survey of Massachusetts, the first not only in the long series of scientific surveys in the United States, but the first survey of an entire state under the authority of government in the world. The American geological association (now the scientific association) was originated at his suggestion, and he was its first president. Among numerous instances of his originality in starting new doctrines, or new arguments, in natural theology, may be mentioned his mode of answering the objection to the resurrection of the body; his proofs from geology of the benevolence of God, of special providence, and of special divine interposition in nature; and his telegraphic system of the universe. Dr. Hitchcock was the first to give a scientific exposition of the fossil footprints of the Connecticut valley, and with him ichnology as a science began. With scarcely an exception, specimens of all the known varieties of these remains are in his cabinet at Amherst, and the "Ichnology of New England," published by the Massachusetts legislature in 1858, is chiefly a description and illustration of his own collections.

HITCHCOCK, ETHAN ALLEN, an American officer and author, born in Vergennes, Vt., May 18, 1798. His father was Samuel Hitchcock, one of the circuit judges of the United States under the administration of President Washington; and his mother was a daughter of the celebrated Ethan Allen. He was graduated at West Point in 1817, entering the corps of artillery as a 3d lieutenant. He was subsequently transferred to the infantry at his own request, and was soon promoted. He was placed on duty as an officer of the military academy in 1824, and in 1829 he became the military commandant of the corps of cadets, in which office he continued until 1833. From 1837 to 1840 he was charged by

the war department with the superintendence of the north-west Indian department. He served in Florida against the Indians, and in the war with Mexico, where, having attained the rank of lieutenant-colonel, he served on the staff of Gen. Scott, and was appointed acting inspector-general. In the course of the campaign of 1847 he received two brevets, one as colonel and another as brigadier-general. At the close of the war he travelled in Europe for more than a year, and on his return home he was sent to the Pacific coast, as military commandant of the Pacific division. He returned to the eastern states in 1854, and the following year voluntarily resigned his commission. In 1855 he printed for private circulation a pamphlet in support of his opinion that genuine alchemy was not an art for making gold, but that the alchemists were students of man, whose perfection was symbolized by their "philosopher's stone." He subsequently published "Remarks upon Alchemy and the Alchemists" (12mo., Boston, 1857), and "Swedenborg a Hermetic Philosopher" (New York, 1858.)

HITCHCOCK, PETER, an American jurist, born in Cheshire, Conn., Oct. 19, 1781, died in Painesville, Ohio, May 11, 1853. He was graduated at Yale college in 1801, was admitted to the bar in 1803, and removed to Burton, Geauga co., Ohio, in 1806. He was elected to the Ohio house of representatives in 1810, and to the senate of Ohio in 1812 and 1815, and was speaker of that body in the session of 1815-'16; was elected in 1816 a representative in congress, and served two years; was again elected a member of the senate of Ohio in 1833, and presided over that house as speaker during the session of 1834-'5; and in 1850 was elected a member of the convention which formed a new constitution for Ohio. He was commissioned a judge of the supreme court of Ohio, Feb. 5, 1819, for a term of 7 years, and held the office by successive reappointments, except in the 5 years 1833-'5 and 1842-'5, until Feb. 9, 1852, when his term was closed by the operation of the new constitution. His whole service as a judge, in a court of the highest jurisdiction, was 28 years, for 6 years of which he was chief judge, from which high office he retired at the age of 70.

HITZIG, FERDINAND, a German biblical critic and orientalist, born in Baden, June 23, 1807. He was graduated at Göttingen in 1829, and in 1833 was called to Zürich as professor of theology with special reference to the exegesis of the Old Testament, but his lectures soon comprised the New Testament and the Semitic and other oriental languages. Hitzig's fame as a biblical scholar rests mainly on his "Translation and Interpretation of the Prophet Isaiah" (Heidelberg, 1833). A translation with a historico-critical commentary of the Psalms (2 vols., Heidelberg, 1835-'6) was followed by several works on the prophets. Of his other works may be mentioned: "The Invention of the Alphabet" (Zürich, 1840); "Earliest History and Mythology of the Philistines" (Lepsic, 1845); and "Abridged Manual for the Old Testament" (Lepsic, 1855).

HNEWKOWSKY, SEBASTIAN, a Bohemian poet, born in Zembrak, March 19, 1770, died June 7, 1847. He holds a conspicuous position among the regenerators of Cechic poetry, by his influence upon other literary men, and by his own writings, among which are dramatic and poetical works, an epic entitled "The Bohemian War of Maidens," and a poem on Faust.

HOADLEY, BENJAMIN, an English prelate, born in Westerham, Nov. 14, 1676, died in Chelsea, April 17, 1761. After leaving Cambridge, he was for some years lecturer of St. Mildred's, and in 1704 was settled as rector of a church in London. He soon made himself known as a champion of liberal opinions in his controversies with Atterbury and the high church party; and his "Measure of Obedience," on the doctrine of non-resistance, so pleased the commons, in 1709, that they petitioned the queen for his preferment, but she gave no heed to the request. On the accession of George I., however, he was promoted successively to the sees of Bangor in 1715, Hereford in 1720, Salisbury in 1723, and Winchester in 1734. In 1717, while bishop of Bangor, he preached his celebrated sermon on the words: "My kingdom is not of this world," which gave rise to the famous "Bangorian controversy," in which Hoadley asserted the supreme authority of Christ as king in his own kingdom, and that he had not delegated his power, as absent temporal rulers sometimes do, to any persons as his vicegerents or deputies. In these positions he was assailed by many, and especially by William Law, the champion of authority both in church and state, and perhaps the ablest of his opponents. The discussion became so violent in the convocation that that body was prorogued in 1717, and not again permitted to meet for the despatch of business. His writings, which are numerous, were collected and published by his son John Hoadley (3 vols. fol., London, 1773). Akenside has paid a handsome tribute to his memory.—**BENJAMIN, M.D.**, son of the preceding, born in London, Feb. 10, 1705, died in Chelsea, Aug. 10, 1757. He entered Cambridge April 8, 1722, was graduated doctor in medicine in 1729, and then settled in London, where his professional success was such that in 1742 he received the appointment of physician to his majesty's household. Four years later he became physician to the household of the prince of Wales, continuing to hold both offices at the same time, although the prince was not on good terms with his father. Having already achieved a reputation in the world of letters by several scientific lectures and papers, he produced in 1747 his comedy of "The Suspicious Husband," which ranks among the most entertaining on the English stage. He assisted Hogarth in his "Analysis of Beauty," and in 1756 published in connection with Mr. Wilson "Observations on a Series of Electrical Experiments." —**JOHN**, brother of the preceding, born in London, Oct. 8, 1711, died March 16, 1776. He was educated at Hackney and Cambridge, and

afterward began the study of law, which he abandoned after having received the degree of LL.B. In 1735 he was admitted to orders, and received from his father the appointment of chancellor of Winchester. He was chaplain to the households of the prince of Wales and the princess dowager, prebendary of Winchester, rector of St. Mary's near Southampton and of Overton, and master of St. Cross. He wrote several poems contained in Dodsley's collection, and was the author of "Love's Revenge," a pastoral (1737); "Jephtha," an oratorio (1737); "Phoebe," a pastoral (1748); and "The Force of Truth," an oratorio (1764). He wrote the 5th act of Miller's "Mahomet," is supposed to have had a share in the composition of his brother's "Suspicious Husband," revised Lillo's "Arden of Feversham," and left a number of dramatic pieces in MS. He also edited his father's works.

HOANG-HAI. See **YELLOW SEA**.

HOANG-HO (Yellow river), called by the Thibetans Rmetchu, by the Mongols Karamuren or Khatun-gol, a river in China, said to be the 6th in the world in length. It rises in Tartary in the territory of Koko-nor, about lat. 35° 30' N., long. 96° E., 1,290 m. distant in a straight line from its mouth, although its whole course, including windings, is estimated by Ritter to exceed 2,450 miles. Its sources have never been visited by Europeans. According to Chinese accounts, it takes its rise from two small lakes on the S. declivity of the Bayan Kara mountains, and is known at first as the Tshi-ping-ho (river with red banks). It passes through the lake Oling-hai, and, receiving then the name of Hoang-ho, flows S. E. and E. through a valley formed between the W. part of the Peling range and the E. extremity of the Bayan Kara, until it reaches the Chinese frontier at the N. W. corner of the province of Se-chuen. Sweeping around the foot of the Bayan Kara, it now flows westward about 120 m. along the N. base of that range, after which it again doubles upon its course with a long curve toward the N. and E., and crosses the frontier into the Chinese province of Kan-su. Its banks up to this point, a distance of nearly 700 m. from its source, are steep and rocky, and the country through which it flows is inhabited almost solely by nomadic tribes. No towns are passed on this part of its course. After entering Kan-su its valley presents more of the aspect of civilization. Its volume is now swelled by numerous large tributaries, of which the Tahia and Tatung are the most considerable. At Lan-chn, the capital of the province, it reaches the great wall, along which it flows E., N., and N. E., and near the city of Ning-hea separates into a labyrinth of branches, which reunite on the borders of the Ortous desert, on the N. side of the wall. After a course of about 350 m. in Mongolia, during which it forms the W. and N. boundaries of the Ortous country and is again divided for a time into many branches, it makes a sharp bend from E. to S., recrosses the wall, and flows along the W. bound-

dary of the province of Shan-si, separating it from Ortois and from the province of Shen-si. It is joined during this southern course by various small affluents. From Ning-hea thus far its left bank is bordered by mountain ranges, those of Holang-shan and In-shan lying between the Ortois and the great desert of Gobi, and another ridge belonging to the province of Shan-si. Along the borders of this province the Hoang-ho is imperfectly known. The Jesuit missionaries relate that it is obstructed by cataracts, the position of which is not laid down, and its course is so rapid that little use can be made of it for navigation, except toward the S. part of the province. In lat. $40^{\circ} 30' N.$ it is 800 feet wide, and about 40 or 50 m. further down its width is 1,200 or 1,400 feet. Its valley is here fertile and well cultivated. At the S. W. extremity of Shan-si the Hoang-ho meets the Hoi-ho flowing eastward, and being joined by that river makes a sharp turn in the same direction, flows through the provinces of Honan, Shan-tung, and Kiang-su, with a slight deviation first toward the N. and then toward the S., and enters the Yellow sea by a broad estuary in lat. $34^{\circ} N.$, long. $120^{\circ} E.$, about 150 m. N. from the mouth of the Yang-tse-kiang. After the junction of the Hoi-ho the Hoang-ho flows for about 150 m. through a hilly country, and then enters the great lowlands of northern China. Here, according to ancient accounts, it formerly separated into two branches, the northern and more considerable of which flowed into the gulf of Pe-chee-lee. There are not wanting indications in the physical aspect of the country that this was the case. Vast morasses are found N. of the present channel of the river, and it has been conjectured that the Wei-ho, which rises in these swamps and finds its way to the gulf of Pe-chee-lee through the Pei-ho, occupies the bed of the N. arm of the Hoang-ho. It is certain that the Hoang-ho is constantly undergoing great changes. For 500 m. of its lower course its bed, according to the French missionary Huc, is higher than the surrounding plain, and in consequence of the accumulation of mud is continually rising. Dikes are built at an enormous expense to confine it within bounds, and the cost of these embankments in a single year (1779) was no less than \$8,000,000. Nevertheless frightful inundations sometimes occur, and the emperor Kien-long declared to Lord Macartney that the Hoang-ho river gave him more trouble than all the cares of government. A canal was built by this emperor to carry off the surplus waters of the stream, extending from Y-fong-hien in Honan to an arm of Lake Hung-tseu-hu, a distance of over 100 m. This lake communicates with the Hoang-ho about 70 m. from its mouth. Embankments are necessary even on the borders of the Ortois desert. M. Huc, who crossed the river at that place in Nov. 1846, found the adjacent country inundated, although it was the dry season. About 40 m. from its mouth the Hoang-ho is crossed by the grand canal.

In the upper part of its course its waters are clear; the yellow tinge on account of which it is named is acquired on its passage through a clayey soil on the frontiers of Kan-su. Its basin covers an area of about 700,000 sq. m.

HOARE, SIR RICHARD COLT, an English topographer and antiquary, born Dec. 9, 1753, died May 19, 1838. Being very wealthy, he devoted himself to literature and art, to avoid the tedium of an idle life. He travelled extensively on the continent, and published an account of his tour through Italy and Sicily. He afterward visited Wales and Ireland, which he illustrated with pen and pencil. His chief work, however, is his history of Wiltshire, ancient and modern. The author did not live to complete it. He printed several other works for private circulation.

HOARE, WILLIAM, an English historical and portrait painter, born at Eye, near Ipswich, about 1707, died in Bath in 1792. He painted portraits of Pitt, Grenville, Lord Chesterfield, the duke of Newcastle, and other distinguished men of the age, and also several altarpieces for churches in England. He was one of the original members of the royal academy, and for many years contributed regularly to its exhibitions.—PRINCE, eldest son of the preceding, and an author and artist, born in Bath in 1754, died in Brighton in 1834. He studied in the royal academy, and subsequently under Raphael Mengs at Rome. In 1799 he succeeded Boswell as foreign secretary to the royal academy. He is best known as the author of a number of dramatic pieces, the chief of which are: "Such Things Were," a tragedy, performed in 1788; "No Song, No Supper," a comic opera (1790); "The Cave of Trophonius" (1791); "Dido, Queen of Carthage" (1792); "The Prize" (1793); "My Grandmother" (1793); "The Three and the Deuce" (1795); "Lock and Key" (1796); "Mahmoud" (1796); "Julia" (1796); "A Friend in Need" (1797); "Chains of the Heart" (1802); "Partners" (1805); "Something to Do" (1808). He published in 1806 "An Inquiry into the Requisite Cultivation and Present State of the Arts of Design in England."

HOBART, JONX HENRY, D.D., an American clergyman, bishop of the Protestant Episcopal church in the diocese of New York, born in Philadelphia, Sept. 14, 1775, died in Auburn, N. Y., Sept. 10, 1830. His ancestors, in 1663, had emigrated from Norfolk, England, and settled in Hingham, Mass. His father, Enoch Hobart, was commander of a merchant ship. In 1788 he entered the college of Philadelphia, whence in 1791 he was transferred to Princeton college, where he was graduated in 1793. At first, owing to some family considerations, Mr. Hobart reluctantly undertook to fit himself for the duties of a merchant in the counting house of his brother-in-law; but finding, after no long experience, that his tastes and inclinations led him in another direction, he resolved to enter upon a course of preparation for the ministry. Receiving at this time an invitation to a tutor-

ship at Princeton, he accepted the post, and began the discharge of his duties in Jan. 1796. At the same time he studied theology under the direction of Dr. Samuel Stanhope Smith, the president of the college. In the spring of 1798 he resigned his tutorship and removed to Philadelphia, where he pursued his studies under the supervision of Bishop White, by whom he was admitted to deacon's orders, June 3, 1798, and was invited to take charge of two suburban parishes near Philadelphia. In 1799 he was called to Christ's church, New Brunswick, N. J., where he remained, according to his engagement, one year; and then, having been married early in May, 1800, to a daughter of the Rev. Dr. Chandler of Elizabethtown, N. J., he became rector of St. George's church, Hempstead, L. I. St. Mark's church, New York, offered him the rectorship, but he declined it. In September of the same year, however, he was invited to become an assistant minister of Trinity church, New York, which position he accepted. In 1801 he was ordained priest by Bishop Provost. Mr. Hobart had already been secretary of the house of bishops, and was elected secretary of the convention of New York, deputy to the general conventions of 1801, '4, and '8, and was on the last two occasions secretary to the house of clerical and lay deputies. In 1806 Union college conferred upon him the degree of D.D. Bishop Moore of New York having been disabled from public service by a paralytic stroke, Dr. Hobart was elected assistant bishop in Feb. 1811, and was consecrated Feb. 29, 1811. In consequence of Bishop Moore's infirmities Bishop Hobart was charged with the entire duty of overseeing the church throughout the state of New York, over the whole of which the diocese of New York then extended. In 1812 he was made assistant rector of Trinity church, and on Bishop Moore's death, in 1816, he became bishop of the diocese, and was also called to the rectorship of Trinity church. Bishop Hobart was specially active in forming a theological seminary in New York, and the result of his efforts was the foundation of the general theological seminary of the Protestant Episcopal church. In 1821 he consented to undertake the duties of professor of pastoral theology and pulpit eloquence in this institution. His health failing under his severe labors in the latter part of 1823, he embarked for England in a packet ship, and arrived in Liverpool, Nov. 1. While abroad he visited Great Britain, France, Switzerland, and Italy, and spent much of his time in investigations and inquiries relative to the progress of religion and the social and moral condition of Europe. Although in England he was received with deference and respect, he was not a little mortified to find that the clergy generally of the American Episcopal church were charged in various publications with not preaching the gospel in its plainness and fulness, and that he himself had been represented as insisting upon externals to the neglect of essentials in religion. To disprove this

charge, he published in London, in 1824, 2 volumes of his discourses, which had been preached in the ordinary course of parochial duty. He returned home in 1825. His first sermon after his arrival was glowing and patriotic to an unusual degree; and though it may be true that the exceptions of the English to its freeness of tone and to many of its opinions were not without force, yet it showed how truly and heartily the preacher was an American as well as a bishop. Theological education, Sunday schools, domestic and foreign missions, the Bible and prayer book society, the Protestant Episcopal tract society, and others of a similar character, commanded his warm and steady support. He visited the Oneida Indians in 1818, and again in 1826; and it was through him that Eleazar Williams (who was afterward thought by some to be the lost dauphin, Louis XVII.) was admitted to orders and officiated among the Oneidas. Bishop Hobart died of bilious fever while on an episcopal visitation at Auburn, and was buried in New York. A widow and several children survived him; one of his sons is now (1860) an assistant minister in Trinity church, New York.—Representing as he did the old-fashioned high churchmen of his day, Bishop Hobart never scrupled to set forth with all boldness the views and sentiments which necessarily brought him into collision with Christians of other denominations, and which were not wholly approved of by many in his own church. Hence, he insisted that the Bible should always be accompanied by the "Book of Common Prayer," as its best interpreter; and advocated the publishing by churchmen of tracts distinctively Episcopalian; the carrying on of missions only in the church's way; and the use of the prayer book or some precomposed form of prayer on all occasions of worship. Hence, he opposed the formation of the American Bible society, the American tract society, and every other plan for carrying on good works by Christians of different denominations amalgamated together for the purpose. Hence, too, he did not acknowledge the validity of any but Episcopal orders, and refused to join with any but Episcopal clergy in ministerial acts and services. Beside a large number of pamphlets, occasional sermons, and charges, he was the author or editor of several publications which have had a very wide circulation. Among his most important works are: "Companion for the Altar" (New York, 1804); "Companion for the Festivals and Fasts" (1804; 21st ed. 1856); "Apology for Apostolic Order" (1807); "State of Departed Spirits;" "Communicant's Manual;" "Clergyman's Companion;" "Christian's Manual of Faith and Devotion;" and an edition of D'Oyley and Mant's "Commentary on the Bible" (2 vols. 4to., 1818-'20). His posthumous works, with a memoir by the Rev. William Berrian, D.D., appeared in 1833 (3 vols. 8vo.).

HOBARTON, or HOBART TOWN, the capital of the British colony of Tasmania or Van Diemen's Land, on the S. side of the island, 20 m. from the sea, at the head of a fine land-

locked harbor called Sullivan cove; lat. 49° 53' S., long. 147° 21' E.; pop. in 1857, 18,258. The river Derwent flows into the head of the bay, and the town is delightfully situated at its mouth. The bulk of the imports and exports of the colony, which in 1856 amounted respectively to £1,442,106 and £1,207,802, come to this port. Hobarton and all the other ports of Tasmania are free to foreign whaling vessels. About 28 vessels with 84 boats and 630 men are employed in the whaling trade, for which the inhabitants evince great aptitude. A prize of £10 is given at the central school of Hobarton to the boy most proficient in navigation, who engages to apprentice himself to a whaler. The city possesses a high school, numerous private seminaries, a mechanics' institute, a magnetic observatory, and a royal society of sciences which publishes its transactions; and 7 weekly newspapers are published. The Derwent is navigable by considerable vessels for 3 m. above the town, and by craft of 50 tons for 20 m. higher.

HOBBEMA, or HOBBIMA, MINDERHOUT, a Flemish landscape painter, born in Coevorden, Holland, or according to some authorities in Antwerp, about 1611, died in 1699. Nothing is known of his personal history, except that he probably lived in Amsterdam, and was on terms of intimacy with Ruysdael, Berghem, and Vandervelde. His subjects are simple landscapes, but the admirable perspective, the fulness and purity of color, and the firmness of execution give to his homeliest scenes a marked and distinctive character. The figures in his pictures were frequently added by Teniers, Ostade, or Vandervelde. Within the last 5 years well authenticated pictures of Hobbema have been known to bring from 60,000 to 80,000 francs.

HOBBS, THOMAS, an English philosopher, born in Malmesbury, Wiltshire, April 5, 1588, died in Derbyshire, Dec. 4, 1679. The son of a clergyman, he was sent at the age of 15 to Magdalen hall, Oxford, where for 5 years he applied himself to logic and the Aristotelian philosophy. He afterward became private tutor in the family of Lord Cavendish (soon created earl of Devonshire), and travelled in France and Italy with his pupil, the son of Lord Cavendish. On his return to England he was intimately associated with Lord Herbert of Cheshire, Ben Jonson, and Lord Bacon, and is said to have aided the last in translating some of his works into Latin. Ben Jonson revised for him his first publication, the translation of Thucydides (London, 1628), undertaken with a view of preventing the disturbances which threatened his country "by showing in the history of the Peloponnesian war the fatal consequences of intestine troubles." Severely afflicted by the death both of his patron and pupil, he again visited France and Italy with a son of Sir Gervase Clifton, but returned to England in 1631 at the solicitation of the countess dowager of Devonshire to undertake the education of

the young earl. With his new pupil he went abroad again in 1634, and during an absence of 3 years enjoyed the friendship of Father Mer-senne, Gassendi, and Galileo. He withdrew again from England in 1640 at the approach of the civil war, and resided for more than 10 years in Paris, where he became acquainted with Descartes. In 1642 a few copies of his *Elementa Philosophica de Cive* were printed at Paris and distributed among his friends, and the work was published by the Elzevirs at Amsterdam in 1647. In that year he was appointed mathematical tutor to the prince of Wales, afterward Charles II., then resident in Paris. In 1650 his treatises on "Human Nature" and *De Corpore Politico* appeared in London, and in the following year his "Leviathan, or the Matter, Form, and Power of a Commonwealth, Ecclesiastical and Civil." The last contains the complete system of his philosophy, treating the same subjects often in the same language as his 3 previous works. After its publication he returned to England, and wrote a "Letter on Liberty and Necessity" (1654), which involved him in a long controversy with Bishops Bramhall and Laney. He carried on also for 20 years a controversy with Dr. Wallis, professor of geometry at Oxford, which gained him little honor among mathematicians; his claim was that he had discovered the quadrature of the circle. His opinions were during this period assailed by all classes of religionists and by many eminent writers; and in 1666 his "Leviathan" and *De Cive* were censured by parliament. Yet he was personally esteemed by his former pupil the king, who granted him a pension of £100 from the privy purse, though, yielding to the persuasions of divines, he forbade the philosopher his presence. His fame, too, was spread throughout Europe; foreign ambassadors were interested to see him; and Cosmo de' Medici, prince of Tuscany, visited him and solicited his portrait and a collection of his works to take to Florence. He passed the latter years of his life at the earl of Devonshire's seats in Derbyshire, and continued to write at an advanced age. His principal later publications are an English version of the *Iliad* and *Odyssey* (1675-7), of which 3 editions were called for in less than 10 years, though Pope characterizes it as "too mean for criticism;" the "Decameron Physiologicum, or Ten Dialogues on Natural Philosophy" (1678); an autobiography in Latin verse (1679, translated by himself into English verse); and "Behemoth, or the History of the Civil Wars of England from 1640 to 1660," published posthumously (1679). He possessed remarkable independence and disinterestedness of character, though he was often as haughty and dogmatic in his manners as in his polemical writings. The earl of Devonshire entertained him in ease, leaving him free to follow his own tastes, and was wont to speak of him as a humorist whom nobody could account for. Dr. Kennet relates some particulars of his daily life in his "Memoirs of the Cavendish Family:" "His professed rule of health

was to dedicate the morning to his exercise and the afternoon to his studies. At his first rising therefore he walked out and climbed any hill within his reach; or, if the weather was not dry, he fatigued himself within doors, by some exercise or other, to be in a sweat. . . . After this he took a comfortable breakfast; and then went round the lodgings to wait upon the earl, the countess, and the children, and any considerable strangers, paying some short addresses to all of them. He kept these rounds till about 12 o'clock, when he had a little dinner provided for him, which he ate always by himself without ceremony. Soon after dinner he retired to his study, and had his candle with 10 or 12 pipes of tobacco laid by him; then, shutting his door, he fell to smoking, thinking, and writing for several hours."—The speculations of Hobbes start from the principle that sensation is the only originator of knowledge and medium of truth; and, as we can perceive through the senses only what is material, he concluded that matter, the material universe, is the only reality. The mind is but a physical organization, and all the phenomena of consciousness result from the pressure or impact of material objects upon it. Sensation consists in the movement of particles of matter, which gradually ceases after the actual period of impact, and the vividness of the conception gradually diminishes. This "decaying sense" is imagination, but, if viewed in connection with the fact of its being a lingering image of the past, then it is memory. Imagination and memory, therefore, are the same thing only viewed from different standpoints. Knowledge he affirms to be of two kinds: first, "knowledge original," derived from direct impressions of external things by sensation; second, remembrance of the former, or knowledge of words or of the truth of propositions. He lays immense stress on language, without which he says the simplest process of reasoning could not be performed; understanding is only the faculty of perceiving the relation between words and things; and errors in reasoning, which is but a numerical calculation, arise only from defective definitions and the wrong employment of names. But, though he thus accepted the extreme results of nominalism, he wrote the weighty aphorism: "Words are wise men's counters; they do but reckon by them; but they are the money of fools." The ethics of Hobbes follow necessarily from his metaphysics. If every thought is but a compound of sensations, then good and evil can be only expressions for agreeable or disagreeable sensations; they have no absolute character, but mean simply personal pleasure or pain, and the highest motives of life must be to attain the one and avoid the other. Moreover, as man does not determine for himself the law of sensation and the conditions of pleasure and pain, it follows that he is absolutely subject to circumstances and the creature of necessity. Hence results the fundamental principle of the political theory of Hobbes. Nature dictates to every man the right

to seek his own happiness, the highest end of being, at whatever expense to his fellow men. The state of nature, therefore, is a state of warfare among men, each seeking to advance only his own interests, and being therefore in hostile collision with every other. Experience, however, proves a state of universal warfare to be one of universal suffering, and reason therefore dictates the institution of government and other social institutions to be the antagonists of man's natural selfishness. The state should be erected into a leviathan power, sufficiently mighty to coerce the will of the individual against his nature, and its perfect form is an absolute monarchy, to which should be given supreme control over every thing connected with law, morals, and religion. Among the principal opponents of the philosopher of Malmesbury in his own time were Clarendon, Cudworth, and Cumberland. Dr. Warburton called him "the terror of the last age. The press sweat with controversy, and every young churchman militant would try his arms in thundering on Hobbes's steel cap." In respect of style he is one of the most admired of metaphysical writers, and one of the best English authors. Mackintosh pronounces it "the very perfection of didactic language," and Macaulay alludes to it as "more precise and luminous than has ever been employed by any other metaphysical writer." The best complete edition of his English and Latin works is that prepared by Sir William Molesworth (16 vols., London, 1839-'45).

HOBBY, a falcon of the genus *hypotriorchis* (Boie). This genus differs from *fulco* (Linn.) in having longer and more slender tarsi, covered in front with large hexagonal scales, and very long and slender toes. The species of this genus, to which the American pigeon hawk (*H. columbarius*, Linn.) belongs, prefer wooded and cultivated places, and are generally migratory; they fly with great rapidity and for a long time, pursuing the swift migratory birds. The common hobby (*H. subbuteo*, Linn.) resembles the peregrine falcon in appearance, but is of smaller size, being only 12 inches long with an expanse of wings of 26 inches, the female being 2 inches longer and wider.

HOBHOUSE, JOHN CAM, Lord Broughton, an English statesman and author, born June 27, 1786. At the university of Cambridge, where he was graduated in 1808, he contracted an intimacy with Lord Byron, with whom in 1809 he travelled over Turkey, Greece, and other parts of southern Europe, and subsequently in Switzerland and Italy. After his return to England appeared his "Journey through Albania and other Provinces of Turkey with Lord Byron" (4to., 1812), which was highly commended; and in 1816 he published the "Last Reign of Napoleon" (2 vols., 8vo.), giving a description of the Hundred Days, of which he was an eye-witness. A volume of verse had previously testified to his literary tastes and accomplishments. In 1819, in consequence of the publication of a pamphlet which contained

a severe attack on the house of commons, he was imprisoned in Newgate on a charge of having committed a breach of privilege. Upon his release his cause was espoused by the electors of Westminster, who, in spite of the strenuous and animated opposition of the whigs, returned him to parliament after a memorable contest. He showed himself an able speaker and an energetic reformer, but his radical opinions became so far modified that in 1831 he entered the cabinet of Earl Grey as secretary of war. He was subsequently made secretary of state for Ireland. In the cabinet of Lord Melbourne he was made president of the board of control, a position which he also occupied in the Russell ministry from 1846 to 1851, when he was raised to the peerage by the title of Baron Broughton of Broughton Gifford in Wiltshire. He has since then participated but little in political life.

HOB-NOB, or HAB-NAB, an English challenge to reciprocal drinking, of uncertain origin. If derived from the Saxon *habban*, to have, and *nabban*, not to have, the question, "Will you hob-nob with me?" would signify primarily: "Do you choose, or not, to have a glass of wine?" According to another explanation, the hob in the days of Queen Elizabeth was a projection in the corner of the chimney where a part of the beer was placed to warm. When beer was required, it was customary for the attendants to ask: "From the hob or not from the hob?" which phrase, being in constant use, was successively contracted to "hob or no hob" and to "hob-nob." Hob-nob is also explained as a north country word, signifying hit or miss, at a venture, rashly.

HOBOKEN, a city of Hudson co., N. J., on the Hudson river, opposite New York, with which it has frequent communication by 3 steam ferries, and about 2 m. above Jersey City; pop. in 1855, 6,727. It contains churches of several denominations, has extensive ship-building yards, and is lighted with gas, and supplied with water, which is brought from the Passaic river. It is chiefly noted as a place of resort for the citizens of New York, or of residence for persons doing business in that city. The "Elysian Fields," in the N. part of the city, are favorite pleasure grounds, and Castle Point, an elevation about $\frac{1}{2}$ m. from the ferries, is frequently visited for its magnificent view of the river and harbor.

HOBSON'S CHOICE, a proverbial expression for a forced choice, when the alternative presented is "This or nothing." It owes its origin to Tobias Hobson, a carrier at Cambridge, England, who, according to the "Spectator," No. 509, was the first man in England to let out hackney horses. He kept a stable of 40 horses, always ready for travelling, and furnished with the proper equipments. Whenever a customer came, he was led into the stable and told to take his choice; but whatever his choice might be, he was ultimately obliged to take the horse which stood nearest to the door. In this

way every person was equally well served according to his chance, and every horse was ridden with the same justice. Hence arose the proverb of "Hobson's choice," when amid a variety an election is forced upon one. Hobson is the subject of two of Milton's short poems, "On the University Carrier."

HOICHE, LAZARE, a French soldier, born in Montreuil, near Versailles, June 25, 1768, died Sept. 17, 1797. He was the son of a poor workman, and being set while a mere child to earn his own living, received scarcely any education. At 16 he enlisted in the army, where he improved his spare moments by study and embroidering waistcoats, which he sold to officers to supply himself with books. On the breaking out of the French revolution, he was sergeant in the regiment of *gardes Françaises*. Being promoted to the rank of lieutenant in the regiment of Rouergne in 1792, he distinguished himself at the siege of Thiouville and in the battle of Neervinden. After the defection of Dumouriez he was charged with want of patriotism, or, as it was then termed, with *incivisme*, and arrested; but a plan of a campaign which he was devising being sent to the committee of public safety, Carnot was so much impressed with its merit that Hoiche was not only liberated from arrest, but at once promoted to the rank of brigadier-general, and placed again in active service. After his successful defence of Dunkirk against the duke of York he received the chief command of the army on the Moselle. He was not successful in his first encounters with the duke of Brunswick, and consequently joined Pichegru, who was at the head of the army on the Rhine; he now defeated the Austrians at Weissenburg, and after taking Germersheim, Spire, and Worms, forced them to evacuate Alsace in 1793. He had secured the favor of several of the members of the committee of public safety, but was suspected by Marat, who caused him to be arrested and brought to one of the Paris prisons. The revolution of the 9th Thermidor saved his life, and he was now placed in command of one of the 3 armies which were to suppress the royalist insurrection in the western departments. He brought his troops to an uncommon degree of efficiency, and succeeded in effectually checking the attacks of the Vendéans, whom he routed in nearly every encounter. In July, 1795, he defeated the royalists, who had landed on the peninsula of Quiberon, with the assistance of an English squadron, and his energy on this occasion added so much to the confidence reposed in him, that the committee of public safety placed in his hands the entire control of the troops along the Atlantic coast. He now forced or persuaded the Vendéans into submission, pursued their chiefs with unrelenting activity, took Charette and Stofflet prisoners, and put an end to the civil war. This was announced, July 15, 1796, by a message of the directory to the legislative councils, who at once adopted a decree declaring that the army of the ocean

and its commander had merited well of their country. On Dec. 16, 1796, he sailed from Brest with a fleet carrying 18,000 soldiers, who were to land on the coast of Ireland; but stormy weather, scattering his ships, prevented their timely arrival in Bantry bay, and Ireland was saved from invasion. On his return to France, Hoche received the command of the army of the Sambre and Meuse, and made preparations for a campaign, the military and political results of which, he hoped, would bear comparison with those gained by Bonaparte in Italy; he crossed the Rhine April 18, 1797, stormed the formidable positions held by the Austrians at Neuwied, defeated them in two other battles, and on the 4th day had advanced as far as Wetzlar, when his course was arrested by the news of the armistice of Leoben. He now resumed his plans for the invasion of Ireland, and meanwhile was induced to favor the designs of the republican members of the directory, who were anxious to put a check to the encroachments of the reactionary party; he sent a detachment of his troops toward Paris, and placed at the disposal of the directory a sum of 30,000 francs that belonged to his wife, to assist them in carrying out their project. The revolution of the 18th Fructidor was successful; and the importance of Hoche's command was greatly increased, the army lately under Moreau being added to his own. With these united forces, which assumed the name of the "army of Germany," he might have accomplished his vast schemes; but a sudden and mysterious illness seized him, and within a few days he died amid excruciating tortures. A post-mortem examination indicated that he had been poisoned; but who was the author and what were the motives of the crime are as yet unknown. Beside the military honors paid to Hoche's remains on the Rhine, a grand funeral ceremony took place in Paris. His name has been given to a square in Versailles, upon which a bronze statue was erected in 1832. His *Correspondance administrative et militaire*, with his *Ordres du jour*, may be found in the appendix to his "Life" by A. Rousselin (2 vols. 8vo., Paris, 1804).

HOCHHEIM, a small town in the duchy of Nassau, on the railway from Frankfort to Mentz, 3 m. from the latter city; pop. 2,200. In its vicinity, and along the banks sloping down to the Main for a space of 3 m., are the vineyards which produce the Hochheimer wine. About 2,500 acres of land cultivated in vines belong to the town of Hochheim. The juice is generally that of acidulous field grapes, and more recently also of Burgundian grapes. The best growths are those called *die Domdechanei* and *der Stein*, which are near the town and protected by its buildings. The former growth, which is the most celebrated, comprises only 22 acres. Its most delicious product is called the Kirchenstück, and sells in good years as high as about \$8 per gallon. The Stein wine is less known, but also of a superior quality, bringing sometimes

even higher prices than the Domdechanei. The name of Hochheimer or Hock is applied in England and America to Rhine wine generally.

HOCHKIRCH, a village of Saxony, 7 m. E. S. E. from Bautzen, memorable for a battle between Frederic the Great and the Austrian general Daun, Oct. 14, 1758. The Prussians, whom the king, contrary to the advice of his officers, had ordered to encamp in an exposed position on an open plain, were attacked before it was light, and in the confusion and darkness suffered a terrible defeat, losing all their camp equipage and baggage. When day broke Frederic found himself nearly surrounded by the Austrians, and ordered a retreat. His loss was 9,000 men, including several of his best generals, and more than 100 guns.—On May 21, 1813, the allies were defeated here by the French under Marmont and Macdonald.

HÖCHST, a small town of the duchy of Nassau, pleasantly situated near the Taunus mountains, on the railway from Frankfort to Mentz, 5½ m. from the former city, and also connected by railway with the adjoining watering place of Soden; pop. 2,500. It contains tobacco, needle, and other manufactories. Tilly achieved a brilliant victory there, June 10, 1622, over the duke Christian of Brunswick. During the 30 years' war it was taken 6 times; and the old castle, where the archbishops of Mentz used to reside occasionally, was then converted into a ruin. In 1795 (Oct. 11) the French under Jourdan were defeated there by the Austrians.

HOCHSTÄTT, a town on the Danube, in the Bavarian circle of Swabia, in the vicinity of which the memorable battle of Aug. 13, 1704, was fought between the French and Bavarians and the English and Austrians, under Marlborough and Prince Eugene. In France and Germany it is known as the battle of Hochstädt, but in England as the battle of Blenheim, after the village of Blenheim or Blindheim, where it was actually fought.

HOCKING, or HOCKNOCKING, a river of Ohio, rising in Fairfield co. near the centre of the state. It flows S. E. through a picturesque hilly country, and after a course of about 80 m. joins the Ohio at the S. E. extremity of Athens co. About 7 m. from Lancaster in Fairfield co. it has a perpendicular fall of 40 feet. It is deep enough for boat navigation for a distance of nearly 70 m., but is obstructed by falls and dams. The Hocking canal passes along its banks, and connects with the Ohio canal.

HOCKING, a S. E. co. of Ohio, drained by the river of the same name; area, 380 sq. m.; pop. in 1850, 14,119. It has a hilly surface with several considerable elevations, and is generally fertile. The productions in 1850 were 85,195 bushels of wheat, 334,342 of Indian corn, 76,122 of oats, and 37,828 lbs. of wool. There were 5 saw mills, 1 grist mill, 2 newspaper offices, 28 churches, and 2,031 pupils attending public schools. Iron ore has been found in the county. Capital, Logan.

HODEIDA, or HODIDA, a town of Arabia, on

the Red sea, capital of a district in Yemen, 100 m. N. N. W. from Mocha, and 35 m. N. W. from Beit-el-Fakih. It is a large and important place, having a safe though shallow harbor.

HODGE, CHARLES, D.D., an American clergyman and author, born in Philadelphia, Dec. 28, 1797. He was graduated at Princeton college in 1815, and at the theological seminary in the same place in 1819. In 1820 he was appointed assistant professor, and in 1822 full professor of oriental and biblical literature in the theological seminary. In 1840 he was made professor of didactic and exegetical theology, to which in 1852 polemical theology was added, which professorship he still (1860) holds. In 1825 he founded the "Biblical Repository and Princeton Review," enlarging its plan in 1829, and, with a single brief interruption, has constantly conducted it, and given it character by his contributions, for more than 30 years. The most important of these papers have been twice reprinted, once in the "Princeton Theological Essays" (2 vols., 1846-'7), and again in his "Reviews and Essays" (1857). His "Commentary on Romans" appeared in 1835, and again, in an abridged form, during the next year; his "Constitutional History of the Presbyterian Church," in 1840-'41; and his "Way of Life," which has gone through repeated editions in this country, and been republished in England, in 1842. After an interval of some years, he resumed his exegetical writing, and has since published commentaries on Ephesians and the two Epistles to the Corinthians. He was moderator of the general assembly of the Presbyterian church (O. S.) in 1846, and one of a committee to revise their "Book of Discipline" in 1858.

HODGES, WILLIAM, an English painter, born in London about 1744, died March 6, 1797. After gaining some repute as a painter of landscapes, theatrical decorations, and architectural views, he accompanied Cook on his 2d voyage to the South sea, furnishing the illustrations for his narrative. He subsequently went to India under the patronage of Warren Hastings, and amassed a fortune, which, however, he lost in an attempt to establish a bank. He published an account of his travels in India, with plates.

HODGKINSON, EATON, an English natural philosopher, born at Anderton, near Northwich, in Cheshire, Feb. 26, 1789. He was intended for the church, but the straitened circumstances of his mother, who was left a widow when he was a child, prevented his receiving a university education. When about the age of 21, he removed with his parent to Manchester, and, possessing a great taste for mechanics, soon determined to make it his exclusive study. Among the first fruits of Mr. Hodgkinson's researches was the discovery that by giving to cast iron rails and beams the form of an inverted T (I) a gain of strength equivalent to upward of 40 per cent. would be secured. Continuing his investigations on the properties of iron, he instituted a series of 227 experiments with reference to the strength of columns, from which he de-

duced formulæ for solid and hollow iron columns, which have been generally adopted and formed into tables for ready reference. His published account of these researches procured him the gold medal and the membership of the royal society. In 1845 he was employed by Mr. Stephenson to prepare the data for the construction of the celebrated tubular Britannia bridge. In 1847 he was appointed on the royal commission to inquire into the application of iron to railway structures, and added to its report memoranda of great value. His papers on the use of iron for engineering and architectural purposes, interspersed through the "Transactions" of the British association and other learned bodies, are considered of the highest authority. In many of his investigations he has been associated with Mr. William Fairbairn.

HODSON, WILLIAM STEPHEN RAIKES, an English soldier, born at Maisemore Court, near Gloucester, March 19, 1821, died in Lucknow, March 12, 1858. He was the 3d son of the archdeacon of Stafford, and in his 15th year was sent to Rugby, whence in 1840 he went to Trinity college, Cambridge, where he was graduated in 1844. A constitutional tendency to headache led him to choose an active rather than a studious life; and, having procured a cadetship in the East India company's service, he landed in Calcutta in Sept. 1845, and at once joined the troops proceeding to the Sutlej campaign. He was appointed to do duty with the 2d grenadiers, and a few weeks after embarking in his new career participated in 3 of the most desperate battles ever fought in India. For several years afterward he was employed in a variety of civil and military capacities, in all of which he evinced unusual intelligence and activity; and in Sept. 1852, he was appointed to the command of the guides, a corps made up of men of various races, of which he had previously been the 2d officer. In the latter part of 1854 he was accused of mismanagement of his regimental accounts and of the public money which had passed through his hands; and although the report of a special military court subsequently fully acquitted him, the jealousy of rival officers procured his dismissal from his command, and he joined the 1st fusiliers as a simple lieutenant. At the outbreak of the sepoy mutiny in 1857 he was commissioned to raise a regiment of irregular cavalry, which under the name of Hodson's horse rendered important service to the British forces at the siege of Delhi. As the chief of the intelligence department he was incessant in his efforts to procure information of the enemy's movements, and frequently for days together was scarcely out of his saddle. He possessed the remarkable faculty of being able to sleep on horseback, and thus avoided the necessity of seeking repose in his tent, like his brother officers. At the final assault of Delhi Hodson, now a captain, was one of the first in the city, and with 50 of his irregular troopers he rode 6 miles out of the city, and succeeded, in the presence of thousands of hostile Mussulmans,

in making a prisoner of the king of Delhi. On the succeeding day, Sept. 22, having learned that 2 sons and a grandson of the king, who had been prominent leaders of the rebellion, were concealed in the tomb of Humayoon, 6 miles distant, he proceeded thither with 100 men and a single officer, secured the princes, and disarmed 6,000 Mussulmans who were with them. On his return to Delhi, finding that he was followed by the enemy and apprehending that a rescue would be attempted and the ends of justice thereby defeated, he formed the design of executing on the spot the princes, of whose complicity in various atrocities he had information from a nephew of the king who was present and who fully identified them. Having explained his purpose to his men in a short address, he accordingly shot the captives with his own hand, after which the rebels dispersed. Subsequently he was promoted to be a major, and was present at the siege of Lucknow under Lord Clyde. He entered the breach with Gen. Napier, and was mortally wounded when advancing with the troops on the begum's palace, dying the next day. A memoir of him, entitled "Twelve Years of a Soldier's Life in India," compiled principally from his letters, and edited by his brother the Rev. George Hodson, has been published in London and reprinted in Boston (12mo., 1859).

HOE, RICHARD MARSH, an American inventor, born in New York, Sept. 12, 1812. He is the son of an English machinist established in New York, and succeeded to his father's business in 1832. He is best known as the inventor and builder of the type-revolving press, patented in July, 1847. This press, intended for rapid working, consists of a horizontal cylinder 54 to 66 inches in diameter, on which the types are held, and of from 4 to 10 printing cylinders, which are arranged around the first and tangential to it. The type cylinder and the printing cylinders are connected by gearing in such a manner that their velocity at the circumference is exactly the same. Each printing cylinder is cut longitudinally, and iron fingers project through the slit to take hold of the paper and relinquish it at the proper moment. Underneath the type cylinder are the inking fountain and distributing rollers, and between the printing cylinders are the inking rollers. The machine is completed by as many tables and flies as there are cylinders, and by a perfect labyrinth of tapes and their rollers. The machine is operated as follows. The feeding is done by hand, the fingers of the machine closing upon the paper at the right moment, so that one sheet may be drawn in at each revolution of the type cylinder. The sheet thus seized is made to roll around the printing cylinder, and by revolving in contact with the type cylinder receives the impression of the types. The fingers then open, and the sheet is carried by tapes to a fly which brings it flat on a receiving table. One of the most important operations in a printing press is an equal distribution of the ink on the type. To

obtain this result, the portion of the surface of the large cylinder which is not covered with the form (about $\frac{2}{3}$) is used as an inking table. The surface of this cylindrical inking table is a little lower than that of the form of type, so as not to come in contact with the printing cylinders. The ink is taken from the fountain and distributed on rollers, the last of which deposits it on the inking table and recedes out of reach to let the form pass. The inking rollers between the printing cylinders have a similar motion to and from the axis of the large cylinder, coming in contact with the table at each revolution, getting inked, and depositing the ink on the form of type immediately after. The first idea of a type-revolving press is due to Nicholson, and was patented in England in 1790; but the inventor did not succeed in holding the types. In Hoe's press the types are placed on a curved bed, between column rules tapering toward the centre to such a degree that if produced each face of the rule would pass at a distance of half the width of a column on the opposite side of the axis of the cylinder. Thus the sides of the two column rules which press the same column of types are parallel. The column rules are held in the form by cross-headed projections entering the bed, and types and column rules are pressed together by screws in the sides and ends of the form; thus the types are held by friction. The types in the centre of each column are the only ones perpendicular to the paper when printing. This is theoretically a bad arrangement, but the angle is so small that no inconvenience results in practice. The Hoe press is now indispensable for newspapers having a large circulation. There is one in Paris, 4 in England (2 of which are used for the London "Times"), and 38 in the United States. The 10-cylinder press strikes off 15,000 copies an hour. Mr. Hoe is prepared to modify his press so as to give double the number of impressions, if necessary.

HOEFER, JEAN CHRÉTIEN FERDINAND, a French scholar and natural philosopher, born at Döschnitz, Germany, April 21, 1811. After studying the ancient and modern languages in his native country, he travelled some time for his health. Having arrived at Lille shortly after the revolution of 1830, with his means exhausted by the shipwreck of a vessel on which he had taken passage for England, he enlisted in a foreign regiment in the French service, then stationed at Marseilles, and was sent to Greece. His regiment being disbanded, he undertook a journey on foot and with an empty purse to Constantinople, but fell into the hands of banditti, and after a very fortunate escape from them returned to France, where he became a teacher. He had been some two years a professor in provincial schools when he was called to Paris by Victor Cousin, to assist in his translation of Plato, and afterward supported himself by private teaching and by writing for scientific periodicals, while attending lectures at the faculty of medicine. In 1836, although still a

student, he engaged in a controversy with Geoffroy St. Hilaire. In 1840 he was graduated doctor in medicine, and commenced practice in one of the most populous districts of Paris. In 1843 he was sent by M. Cousin, then minister of public instruction, on a mission to Germany to examine the system of medical instruction in that country; and 4 years later by M. Salvandy, to examine its system of teaching rural economy. These two journeys scarcely interfered with the publication of many works original and translated, affording evidence of both wonderful activity and uncommon learning. Two papers of his, *Sur la non-authenticité des ruines de Ninive*, brought about a discussion in which E. Quatremère, De Sauley, and De Long Périer participated. Since 1851 he has officiated as the director and editor of Didot's *Nouvelle biographie générale*, to which he has contributed important articles. He is moreover preparing a philosophical work entitled *De la valeur et de l'emploi des forces humaines*.

HOERBERG, PERH, a Swedish painter, born at Virestad in the former province of Småland, Jan. 31, 1746, died Jan. 24, 1816. His parents were among the poorest of the peasantry, and from early youth he was inured to hardships. After struggling many years against poverty, he settled in Stockholm, where, in his 38th year, he became a student in the royal academy of arts. In 1797 he was elected a member of the Swedish academy, and was appointed historical painter to the king. His largest productions were altarpieces, of which he painted 87, several being of great dimensions; and in addition to these he finished, between 1764 and 1807, 520 paintings. Those executed since that time would probably swell the number to over 700, most of which are religious pieces. He left, beside, several thousand drawings, including a set of 291 designs illustrating the life of Christ, and attempted engraving and sculpture with considerable success. He made pretensions also to musical knowledge, and wrote both prose and poetry.

HOEVEN, JAN VAN DER, a Dutch naturalist, born in Rotterdam, Feb. 9, 1801. In 1819 he entered the university of Leyden, where he remained until 1822, studying chiefly natural philosophy and medicine. He began the practice of medicine in his native city, where he remained until 1835, when he was appointed professor of zoology at Leyden. His principal work is *Handboek der Dierkunde* (Leyden, 1827-'33), translated into English by the Rev. W. Clark ('Handbook of Zoology,' 2 vols. 8vo., London, 1856-'8).

HOER, ANDREAS, a Tyrolese patriot, born Nov. 22, 1767, in a tavern at St. Leonard's in the Passeyr valley, called the Sand house (whence his popular name of the *Sandwirth*, or Sand Landlord), shot at Mantua, Feb. 20, 1810. He became generally known as a wine dealer and horse drover between the Tyrol and the north of Italy. In 1796 he led a company of riflemen against the French on Lake Garda, and was

actively engaged in 1803 in organizing the rural militia. He soon distinguished himself as an able and patriotic counsellor as well as soldier, and in 1805 was made a member of the deputa-tion to which was committed the political direc-tion of the country. In 1808, when the disaffec-tion toward Bavaria had become extreme in the Tyrol, and hostilities broke out between France and Austria, Hofer was one of the deputies who went to Vienna to confer with the archduke John on the subject of their national grievances. At this meeting the archduke advised an in-surrection in the Tyrol. The baron von Hor-mayr was charged to carry it out. So rapidly did the measure spread, that within 3 days, be-tween March 31 and April 3, 1809, the whole Tyrol was in arms, and 8,000 French and Bavarian troops were taken prisoners at Hall and Innspruck, and in Sterzing, where Hofer commanded. The Tyrolese were supported by an Austrian army of 10,000 men under the mar-quis Chasteler, but Bavaria sent 25,000 troops to quell the revolt. While the latter were toil-ing through narrow valleys, Hofer fell upon them, and on April 10 defeated Besson and Lemoine in the moors of Sterzing. Within a week the whole province was free, and nearly 10,000 French and Bavarian troops were de-stroyed. But the extent of this success drew down on the Tyrol three armies, one of which, commanded by Marshal Lefebvre, defeated at Mörgl Chasteler's Austrians, and the Tyrolese at Feuer Singer. Hofer soon rallied his coun-trymen, and defeated the Bavarians with great loss at Innspruck. But the defeat at Wagram (July 12, 1809) resulted in a stipulation that Austria should evacuate the Tyrol. Lefebvre again marched into the Tyrol with over 20,000 French, Saxons, and Bavarians, while Beau-mont with 10,000 advanced on the north. It was under these trials that the great military genius of Hofer displayed itself most brilliantly. After sustaining severe reverses (Aug. 3 and 4) Lefebvre with 25,000 Bavarian and French soldiers, including 2,000 cavalry, was completely routed by 18,000 Tyrolese peasants, and driven from the Tyrol. An independent government was formed, with Hofer at its head as absolute ruler. After the peace of Vienna, however, the archduke addressed a proclamation to the Tyrolese urging them to submit, while at the same time three veteran armies marched into the country to force them to obedience. Under these circumstances Hofer sent in his submis-sion in November to Eugene Beauharnais, the viceroy of Italy, and to the Bavarian command-er-in-chief. Deceived by reports of Tyrolese victories and the entrance of the archduke into the Tyrol, he took up arms again, but being defeated fled for concealment to the mountains, where the peasants resisted all inducements to reveal his hiding place. He was at last be-trayed to Gen. Baraguay d'Hilliers by one of his most trusted partisans for 300 ducats, ar-rested by Coutier, commander of a battalion, on the night of Jan. 27, 1810, designedly led

through the Tyrol in order to show that every hope of throwing off the French yoke had disappeared, and taken to Mantua, where Napoleon ordered him to be tried. The examination took place before Gen. Bisson. A majority of the judges wished to save Hofer's life, but Napoleon on being appealed to gave orders that he should be put to death within 24 hours. He died without the slightest indication of fear, refusing to have his eyes bound, and himself giving the word to fire. Schlosser, in his "History of the 18th Century," says: "Hofer's execution was regarded throughout the whole of Europe as a demonstration against every one who should attempt to make any resistance with courage and perseverance to the dominion of the French forced upon them." The property he left his family was confiscated. In 1819 the emperor Francis of Austria conferred upon his family, under the name of Von Passey, the patent of nobility already decreed in 1809. This was the name of the place where Hofer was captured, and where a monument was erected to his memory. The house where he was born and lived was converted by the emperor into an asylum for 16 old Tyrolese, while his remains were brought in 1823 from Mantua to Innspruck, and buried in the cathedral there, near the monument of the emperor Maximilian. A marble statue was placed in 1834 over the tomb.

HOFFMAN, CHARLES FENNO, an American author, born in New York in 1806. From his 6th to his 9th year Hoffman was at a Latin school in New York, and was then sent to an academy at Poughkeepsie, whence he ran away to escape from harsh treatment. His father then placed him under the charge of a Scotch gentleman in New Jersey. In 1817, while passing his vacation at home, he was obliged to submit to amputation of a leg in consequence of having it crushed between a steamboat and the wharf. It is remarkable that, notwithstanding this deprivation, young Hoffman became a proficient in manly sports and healthy exercises, and that to such an extent as threatened to prevent his becoming a scholar; since, when he entered Columbia college, apart from his being distinguished as a society debater, "he was noted rather for success in gymnastic exercises than in those of a more intellectual character." He left college in his junior year, yet was evidently a favorite with the faculty, since at the first semi-centennial anniversary of the incorporation he received the degree of M.A., in company with Fitz-Greene Halleck and William Cullen Bryant. After studying law he was admitted to the bar at the age of 21, and practised for 3 years, during which time he made various minor contributions to literature, and became associated with Mr. Charles King in the editorship of the "New York American." In 1833 Hoffman went to the West for his health, and recorded his experiences in a series of letters entitled "A Winter in the West" (2 vols. 12mo., New York and London, 1835), which became very popular in England as well as

America. From the same western materials he drew the "Wild Scenes in the Forest and the Prairie" (2 vols. 8vo., London, 1837). This was followed by "Greyslaer" (New York, 1840), founded principally on the well known "Beauchamp murder" of Kentucky. In Dec. 1832, Hoffman established the "Knickerbocker Magazine," of which he edited several numbers, but it was soon transferred to the Rev. Timothy Flint. He was afterward editor of the "American Monthly Magazine," and of the "New York Mirror." In 1842 his lyrics, which had been extensively known to the public in a scattered form, were published in one volume, entitled "The Vigil of Faith, and other Poems." "The Echo, or Borrowed Notes for Home Circulation," was the title of a second volume of poetry, suggested by a charge of plagiarism from Moore made against him by the "Foreign Quarterly Review" in a notice of Griswold's "Poets and Poetry of America." During 1846-'7 he edited the "Literary World," and after leaving that journal contributed to it a number of essays and stories, entitled "Sketches of Society," which have always been highly popular. Some of these were written subsequent to the commencement of a mental disorder which began to manifest itself about this time, and which since 1850 has kept him in complete retirement from the world.

HOFFMAN, DAVID, LL.D., an American lawyer and writer, born in Baltimore, Dec. 25, 1784, died in New York, Nov. 11, 1854. From 1817 to 1836 he was professor of law in the university of Maryland, during which time he published many works on jurisprudence. Having retired from his professorship, Mr. Hoffman travelled for two years in Europe, and after his return exerted himself in securing the election of Gen. Harrison to the presidency of the United States. He was chosen one of the presidential electors from Maryland, and after the election settled in Philadelphia. He practised law until 1847, when he again visited Europe for the purpose of fulfilling some literary projects, returning to America in Dec. 1853. His principal work in jurisprudence, entitled "A Course of Legal Study, respectfully dedicated to the Students of Law in the United States" (2d ed., 2 vols. 8vo., 1836), was commended in high terms by Justice Story, Chief Justice Marshall, Chancellor Kent, and other eminent jurists both in America and England, the first named of whom declared that "it contained by far the most perfect system for the study of the law which had ever been offered to the public." His "Legal Outlines," of which but one volume ever appeared, has also been commended as a text book. His last publication is "Chronicles selected from the Originals of Cartaphilus the Wandering Jew" (2 vols., London, 1855).

HOFFMAN, FRANÇOIS BENOÎT, a French dramatist, poet, and journalist, born in Nancy, July 11, 1760, died in Paris, April 21, 1828. After studying law at Strasbourg, he entered the army, and passed some time in Corsica.

His family having purchased his discharge, he returned to Nancy, whence he went to Paris. Shortly after his arrival he published a volume of poems (1785), and wrote a successful play on the subject of Phædra. Having visited Italy, he wrote several pieces after his return which caused much excitement in the dramatic and political circles of the day. When the revolution broke out, having introduced into his opera of "Hadrian" that Roman emperor in a chariot drawn by horses which had belonged to the queen, he was accused of a desire to testify respect for the emperor of Germany, and it was insisted that a change should be made in the play; but Hoffman refused, withdrew the piece, and swore never to set foot in the opera house again. He wrote for the *Journal des débats* for more than 30 years.

HOFFMANN, ERNST THEODOR WILHELM (AMADEUS), a German writer, born in Königsberg, Jan. 24, 1776, died in Berlin, June 25, 1822. He manifested an early taste for music and drawing, in which at the age of 14 he was already a great proficient. Having entered the university of his native place, where he applied himself to the study of law, and also to eccentric amusements and intrigues, he was graduated in 1795, and in 1796 began the practice of law at Glogau, where he continued his studies, making many eminent friends and meeting continually with the most singular adventures. He was soon afterward appointed referendary to the superior court of Berlin, and in 1800 was named assessor of the province of Posen; but having drawn a number of caricatures containing allusions to the "scandalous chronicle" of the town, the minister, instead of signing his appointment as counsellor, sent him to Plock (1802). Before his departure, Hoffman married a young Polish lady, who shared his exile. While at Plock he wrote much, composed masses and a grand sonata, and copied in pen drawing all the vases of the Hamilton collection. In 1804 his friends in Berlin succeeded in having him appointed counsellor of the regency at Warsaw. Here his life became a strange mixture of legal duties and theatrical management, his clients visiting him behind the scenes, where he was painting or training musicians. The entry of the French army reduced him to poverty. He wandered to Berlin and Bamberg, and was finally invited by his future biographer Rochlitz to write for the newspaper which the latter then edited at Leipsic. In compliance with this request he wrote "Observations on Beethoven's Symphony," and "Kappelmeister John Kreiser." He also took part for some time in the editorship of the journal. His sufferings at this period were great and varied. He lost his daughter, saw his wife shockingly maimed by an accident, and had his system shaken by a nervous fever. But during 8 years he was always busy, though as dissipated as industrious, passing his nights in revels, and his days as editor, leader of an orchestra, translator, designer, machinist, fresco painter,

or church singer. He was intimate with Jean Paul Richter and Karl M. von Weber, and became with Holbein director of the theatre of Bamberg. While directing the orchestra of the theatre of Dresden, Hoffmann was surprised by the entry of the French army, and witnessed some of the worst horrors of war, which he has described in a letter that shows him to have been a man of startling peculiarities. After fresh changes as manager, author, and lawyer, Hoffmann received in 1816 an appointment as counsellor of the *Kammergericht*, soon after which he obtained much celebrity through the success of several operas and other musical compositions. From this time he had money in abundance, and his eccentricities and dissipations were redoubled. He was sought by the first society, but took refuge in wine cellars among wild companions. At times he would sketch, and there is still in a tavern in Berlin an album filled with his drawings. To render his dissipation less gross and public, his literary friends formed a club known as the *Serapions-Brüder*, and the results of their meetings were written by Hoffmann in the form of a collection of articles bearing the same name, which contains his best tales (4 vols., Berlin, 1819-'21, with a supplementary vol., 1825). One of the greatest griefs in his strange life was the death of a favorite cat, "Murr," which he regarded as a being endowed with intelligence; and he actually published a book containing the supposed reflections of this animal (*Kater Murr*). Meanwhile he continued with success his literary, legal, and musical efforts, making money rapidly, while an appointment as counsellor to the court of appeal greatly added to the advantages of his position. Unfortunately he was soon after seized with a disease from which he suffered terribly for many months until his death. During his illness he continued to dictate; and though he had when in health manifested in the most trying situations a complete disregard of death, he now often exclaimed: "Life at any price." Hoffmann was in person extremely small, but well made and remarkable for continual restlessness, an arch, mocking expression of countenance, and a peculiar voice. Among his most celebrated and curious books is *Die Elixire des Teufels* (Berlin, 1816). A full collection of his works was published in Berlin (16 vols., 1827-'8; 5 vols. additional, 1839). One of his tales is translated in the "Specimens of German Romance," by T. Carlyle.

HOFFMANN, FRIEDRICH, a German physician, born in Halle, Saxony, in 1660, died there in 1742. He was graduated at Jena, and established himself as a physician at Minden in 1682. He visited Holland and England in 1684, and after his return was appointed physician to Frederic William, elector of Brandenburg. The elector Frederic III., afterward king of Prussia, appointed him in 1693 chief professor of medicine in Halle, and he retained this position until his death. His name ranks with those of Boerhaave and Stahl. He was one of the first

to advance medicine from the old mediæval grounds, maintaining that the phenomena of living bodies were not to be explained by the laws of inanimate or inorganic nature, but that they depend on the continual action of life. If his theories are at present obsolete, it is still true that he at least supplied new bases on which newer and more correct principles were founded. He tested the action of many medicines, and invented new ones, of which the *elixirum viscerale* and *liquor anodynus* are still in use. He was the discoverer and introducer of Seidlitz waters, and of the salt obtained from them. Among his works which are still of value are the *Rationalis Systema Medicinæ* (Halle, 1718-'40), *Medicina Consultatoria* (1721-'39), and *Consultationum et Responsorum Medicinalium Centuriæ* (1734).

HOFFMANN VON FALLERSLEBEN, HEINRICH AUGUST, a German poet and antiquary, born at Fallersleben, Hanover, April 2, 1798. He began in 1816 the study of theology at Göttingen, but soon abandoned it for literature and German philology, and to perfect himself in these went to Bonn. Here in the society of the brothers Grimm he made rapid progress, publishing in 1820 his *Bonner Bruchstücke von Otfried*. He then travelled much and made thorough researches in Belgium, Holland, Germany, and Denmark, collecting old poetry. He was from 1823 to 1843 professor and librarian at the university of Breslau; but having among his publications of old and feudal songs edited a collection (*Unpolitische Lieder*, 1840-'41) which was extremely republican, he was deprived of his place by a special royal decree; an event which rendered him very popular. He now travelled for two years, studying languages and literature, until he settled in 1845 in Mecklenburg. In 1848 he received a pension and permission to return to Prussia. His political, liberal, and bacchanalian songs enjoy so great a reputation in Germany that he has during his travels frequently been received with the warmest popular demonstrations and festivities. The publication of the *Unpolitische Lieder* led the way to a school of energetic writing, which attacked not only political abuses, but also the heavy, unintellectual tone of *Philisterthum*, or bourgeois life, and advocated genial activity. Hoffmann's contributions to journalism are extremely varied and interesting.

HOFFMANNSEGG, JOHANN CENTURIUS, count, a German botanist, born in Dresden, May 23, 1766, died there, Dec. 13, 1849. He studied in Leipsic and Göttingen, served as an officer in the Saxon guard from 1783 to 1786, and afterward spent some years in travel and in scientific discovery, his investigations being particularly directed to the flora of Portugal. He discovered several hundred new plants, and also made important contributions to entomology. After his return to Germany, he published, with the aid of H. F. Link, his celebrated *Flore Portugaise* in French and Latin (fol., Berlin, 1809-'33), a magnificent work, toward the cost

of which he himself contributed nearly \$40,000. It was in recognition of his services to botany that Cavanilles gave the name of *Hoffmannseggia* to a genus of South American plants. In addition to the *Flore Portugaise*, Hoffmannsegg published a catalogue of the plants in his possession, and Link gave to the world his *Voyage en Portugal* (Paris, 1805).

HOFLAND, BARBARA, an English authoress, born in Sheffield in 1770, died Nov. 9, 1844. She was the daughter of Robert Wreaks, a manufacturer in Sheffield, and in 1796 was married to Mr. T. Bradshaw Hoole, a gentleman also engaged in the manufacturing business. He died in about two years, and soon after pecuniary reverses compelled her to rely upon her pen for support. In 1805 she published a volume of poems, and with the proceeds established a small school at Harrowgate. In 1808 she was married to the artist Thomas C. Hofland, and for many years contributed by her literary labors to their mutual support. Her books were written chiefly for young people, and such was the success with which she addressed this class of readers that it is said nearly 300,000 copies were sold during her life. In America they were very popular, and her "Son of a Genius," "Clergyman's Widow," and some others, went through many editions here. She was an industrious writer, and her last book, "Emily's Reward, or a Holiday Trip to Paris," was completed just before her death.

HOFMANN, DANIEL, a German divine, born in Halle in 1538, died in Wolfenbüttel in 1621. At first professor of ethics in Jena, he afterward taught theology in Helmstedt, and became well known in the stormy controversies of the reformation, opposing Beza on the subject of the eucharist. He was censured by an assembly of divines in 1593, and threatened by them with excommunication. He published in reply a famous apology. In 1598 he boldly asserted that there must always be a contradiction between the truths of theology and those of philosophy, attempting to prove this by extracts from the Pauline epistles and Luther's writings. Accused by Martini and Caselius, he was obliged in 1601 to recant; but returning the next year to his original views, he was deprived of his professorship. His followers, on account of their belief in opposing truths, were called Duplicitists, their opponents Simplicists.

HOFWYL. See ELLENBERG.

HOG (*sus*, Linn.), a well known pachydermatous animal, found throughout the world, and sufficiently characterized in the article BOAR, in which also the babyronssa hog is alluded to. Beside the common *sus scrofa* (Linn.), the hogs, as a family, have been used to include the peccary (*dicotyles*, Cuv.) and wart hog (*phacochærus*, F. Cuv.); and the name of hog or pig has been erroneously applied to some of the caries, the armadillo, the porpoise, and other animals with porcine appearance and habits. The dentition is as follows: incisors $\frac{3}{2}$ or $\frac{2}{2}$, canines $\frac{1}{1}$, and molars $\frac{27}{27}$, 42 or 44 in all; the

lower incisors project forward, and the canines, even the upper, curve upward. The feet are 4-toed, the 2 anterior or intermediate toes being the largest, and the 2 lateral or posterior scarcely if at all touching the ground. The utility of the hog as an article of food is in great measure owing to the remarkable fecundity of the animal in all climates except the polar; capable of reproduction at about a year old, and producing from 8 to 12 and even more at a birth twice every year, the supply will always be equal to the demand. Vauban has estimated the product of a single sow, with only 6 young at a time, in 10 generations to be about 6,500,000, of which 500,000 may be deducted on account of accidental death. The ease with which the animal is raised renders it advantageous property for the poorest classes. The hog was highly esteemed by the ancients, and was the animal sacrificed to Ceres, the goddess of the harvest; in Rome under the emperors the art of cooking its flesh was practised in the most luxurious and costly dishes, and in a manner equally cruel and disgusting. In hot climates, as in Egypt, pork is not considered wholesome, and accordingly the legislators and priests of that country forbade its consumption as a sanitary measure; the Jewish and Moslem lawgivers also prohibited it, and these sects abstain from its flesh even in cold climates, where it might be used with safety. Pork, however, is generally so charged with fat, and so apt to be the matrix of entozoa, that it is ranked among the least desirable meats, and especially to be avoided by persons of delicate stomachs. The alleged special connection between scrofula and the use of pork for food rests upon no good foundation, as this disease may and does originate from totally different causes. The filthy habits of the hog are in great measure due to its domestication; the wild hog is cleanly, and selects its food chiefly from vegetable substances; the domesticated hog is kept in a small pen, fed upon the most disgusting food, and is regarded as much an instrument for converting filth into compost as an animal for the preparation of wholesome meat. The hog has the propensity to wallow in the mire common to all pachyderms, and generally for the purpose of ridding itself of vermin, or of protecting its thinly covered skin from the attacks of insects; the wild boar in this respect is no more dirty than the elephant, the rhinoceros, and the hippopotamus.—The hog occupies so prominent a place in domestic economy, commerce, and the arts, that it may be well to mention those generally considered the best varieties. In 1856 the whole number of swine in the United States was estimated at 40,000,000, of the estimated value, at \$7 a head, of \$280,000,000. If this animal, whose flesh, fat, hair, and bones are so valuable, can be improved even to the amount of \$1 for every animal, an immense sum will be realized to the farmer. Swine were probably introduced from Spain into Hispaniola by Columbus in 1493, into Florida by De Soto in 1538, into Nova

Scotia and Newfoundland in 1553, into Canada in 1608, and into Virginia in 1609, where they multiplied so rapidly that in 18 years the people were obliged to palisade Jamestown to keep them out. Different breeds are prized in different districts, according to the fancy of producers, the facility of raising them, and the particular object of the farmer. The Chinese hogs, both the white and black varieties, are easily fattened, and have small bones; indeed they are generally too fat to be esteemed as pork, and are considered to make poor bacon; bred carefully, and mixed with other stocks, they are valuable animals. The Neapolitan is the most celebrated of the Italian breeds, doubtless descended from the improved varieties of ancient Rome, and the stock of most of the English breeds; though not very hardy, the flesh is of superior quality; it is small, black, with few bristles, short snout, erect ears, and small bones; crossed with the Berkshire breed, the form is improved and the constitution hardened, with a remarkable tendency to fatten easily. The Berkshire, an English breed, black or white, is larger than the Neapolitan, with more bristles, and less fat to the meat, which is well suited for bacon and hams; this was formerly preferred above all others in many parts of New England, but its cross with the Chinese is more profitable, as the weight is heavier with light feeding, and the disposition milder. The Essex, crossed with the Neapolitan, is one of the most valuable, and has taken more prizes in England than any other breed; it is black, of good size and symmetry, mild disposition, easily fattened; the meat of excellent quality, and the dressed weight at 12 and 18 months 250 to 400 lbs.; it is not subject to cutaneous diseases. The Irish grazer is slow in coming to maturity, but crossed with the Berkshire is an excellent variety. The Woburn or Bedford breed was originally sent by the duke of Bedford to Gen. Washington, and was produced at Woburn, England, by a cross of the Chinese boar and a large English hog; when pure they are white, with dark ash-colored spots; they are of large size, with deep round bodies, short legs, and thin hair, easily kept and maturing early. The Middlesex is a popular breed in England, and has been considerably imported into the United States; it is derived from a mixture of the Chinese with some larger stock; the color is usually white, and the size larger than the Suffolk, weighing at 18 months 800 to 900 lbs.; the bones are smaller than in the Essex. But the favorite of all breeds seems now to be the Suffolk, so named from that county in England, whence the London market has long been supplied; the present breed is believed to have originated from the old Suffolk crossed with the Chinese and Berkshire; the pure breed is remarkably symmetrical, small and compact, short-legged and small-headed, the exact opposite of the long, lank, and lean hogs of the western prairies; their early maturity, small consumption of food, and tendency to fat, compensate for their want of

size; the color is white. These are the most esteemed varieties; there are many others, imported and domestic, which thrive well in peculiar districts, and which are more or less extolled by their respective fanciers. While hogs are kept in New England and the middle states mostly in pens, in the West they are allowed to range in the woods and fields till within 3 months of the time of killing them, feeding upon clover, corn, acorns, and mast.—No animal displays the changes arising from domestication more than the hog, as may be seen by contrasting the large, savage, long-legged wild boar, leading dogs and horses a weary chase, with the small, docile, plump, short-legged Suffolk, with difficulty getting from one side of his pen to the other. It is not probable that all the varieties of the hog are derived from the wild boar of Europe and Asia; the Polynesian species, the African, and perhaps the babyroussa, have become crossed with introduced breeds, causing the same variety and confusion observed in all domesticated animals; the reasons for not of necessity referring these to a single origin have been given in the article Dog. The hog is not a stupid animal; like other pachyderms it is susceptible of education, and the stories of learned pigs and hunting hogs do no discredit to the order which contains the elephant.—Several species of fossil hogs, of the genus *sus*, are found in the tertiary and diluvial deposits of central Europe; the fossil hogs seem to have been, like the present animal, charged with fat; the teeth are the portions generally met with, as the bones from their spongy character would soon decay. Allied species are also found in the same formations in India.

HOGAN, JOHN, an Irish sculptor, born in Tallow, co. of Waterford, in Oct. 1800, died in Dublin, March 27, 1858. Originally a lawyer's clerk, he showed so decided a taste for sculpture, that at the age of 23 he was enabled by the liberality of some friends to visit Rome for the purpose of study. His "Drunk Fann," one of his most original conceptions, was pronounced by Thorwaldsen worthy of an Athenian studio. His whole artistic career was passed in Ireland, and his works are chiefly religious subjects and monumental.

HOGARTH, GEORGE, a British author and musician, born in Scotland about 1796. In early life he was a writer to the signet in Edinburgh, but went to London as a musical critic and author. In 1835 he published his "Musical History, Biography, and Criticism," and in 1838 "Memoirs of the Musical Drama," of which an abridged edition, under the title of "Memoirs of the Opera—Italy, France, Germany, and England," appeared in 1851. He has published some other miscellaneous works on music, and has been a frequent contributor to the daily press on musical topics. On the establishment of the "London Daily News" by his son-in-law, Charles Dickens, he became its musical critic. His writings are considered standard authorities on the subjects of which they treat.

HOGARTH, or more properly HOGART, WILLIAM, the great satirical painter of England, born in London, Nov. 20, 1697, or according to some authorities in 1698, died Oct. 26, 1764. His father, the son of a Westmoreland yeoman, and by profession a teacher and an occasional corrector of the press, could do little more for him than "put him in the way of shifting for himself." His education, therefore, was scanty; but his early taste for design was evinced in the number and variety of the ornaments with which his school books were adorned, and which he tells us were more remarkable than the exercises themselves. In due time he was apprenticed to a silversmith named Gamble, and, in the intervals of his labors in engraving arms and ciphers, gradually acquired a knowledge of drawing from nature. At 20 years of age engraving on copper was his utmost ambition. The first indication of the direction his talents were to take was given in a humorous illustration of a pot-house brawl, of which he was a witness. Upon the expiration of his apprenticeship in 1718 he attended the lectures of Sir James Thornhill, sergeant painter to the king, and drew from the life at the academy in St. Martin's lane, without, however, attaining any great proficiency. His first employment seems to have been the engraving of shop bills and arms, after which he furnished frontispieces and sets of plates for books, of which his illustrations of "Hudibras" afford a familiar but not very felicitous example, as he was always more successful in illustrating his own ideas than those of others. Having meanwhile acquired some facility in painting, he endeavored to find employment in painting portraits, a branch of his art in which, notwithstanding his avowed contempt for it, he might have attained eminence had he chosen. Thus struggling on, and always contriving, as he tells us, to be "a prompt paymaster," he ventured in 1730 upon a "stolen union" with the daughter of his former master, Sir James Thornhill, which at first proved very unpalatable to the court painter; but when his son-in-law began to gain distinction Sir James became reconciled to the young couple, with whom he lived in amity until his death. Shortly after his marriage Hogarth adopted portrait painting as a profession, and also commenced what he called "small conversation pieces," in which the figures were drawn from the life, and often in humorous attitudes, though not burlesques. From this class of subjects he naturally proceeded to those more earnest scenes of daily life on which his fame rests. In 1734 appeared the 6 prints of the "Harlot's Progress," designed and engraved by himself, and the artist at once became famous. Upward of 1,200 subscribers entered their names for the series, of which 8 piratical imitations almost immediately appeared, to the detriment of the painter, who in 1735 procured the passage of an act of parliament securing to an engraver the copyright of his plates for 14 years. Recognizing by the applause which greeted these works his true

path to fortune, he renounced portrait painting, and followed up his success by the "Rake's Progress," "Industry and Idleness," "Marriage à la Mode," the "Four Times of the Day," the "Four Stages of Cruelty," "Beer Lane" and "Gin Lane," and other works, in series or single, which were engraved by himself, and were produced at regular intervals until the close of his life. Appearing at a time when the national efforts in art were few and feeble, they won a popularity which has perhaps increased with time, and to which that of no contemporary artist can be compared. To the last he retained his wonderful powers, and a careful comparison of all his works will show no lack of invention or satiric humor in any of them. Like many men of genius, however, Hogarth had his foibles, and among them was the impression, which his reputation as a satirist could never shake, that the highest branch of the art, historical painting, was his true vocation. He railed at the old masters, especially deriding the pretensions of connoisseurs and the popular estimates of the value of old pictures, and with a self-confidence almost ludicrous undertook to show that no preliminary training was necessary to produce a good historical painting. The result was his "Paul before Felix," the "Pool of Bethesda," and some other works executed at the outset of his career; and "Sigismunda," painted in 1759, in competition with a picture on the same subject by Correggio, and in direct illustration of his principle. In all these, notwithstanding some points of excellence, it is easy to see that the artist is treading on unfamiliar ground. The ridicule which the last mentioned picture encountered equalled that bestowed upon his "Analysis of Beauty" (4to., London, 1753), the leading principle of which is that a curved line, in shape somewhat like the letter S, is the foundation of all beauty. But Hogarth preserved his equanimity unmoved until his unhappy quarrel in 1762 with Wilkes and Churchill, which he seems to have provoked by a print, entitled "The Times," indirectly ridiculing Wilkes and the opponents of the ministry. Wilkes replied in a strain of coarse abuse in the 17th number of the "North Briton," and Churchill in a poetical epistle lashed the painter, and more particularly "Sigismunda," with all his strong powers of satire. Hogarth revenged himself upon his opponents with his pencil, depicting the former simply in his natural ugliness, with a Satanic leer which the demagogue could not but acknowledge was genuine, and the latter as a canonical bear holding a pot of porter and hugging a knotted club. "Never," says Walpole, "did angry men of their abilities throw mud with less dexterity." The controversy, however, affected Hogarth's health and spirits, and probably hastened his death.—It was long the fashion to assign to Hogarth's works no higher merit than that of clever caricatures; and his contemporaries certainly had an interest in attempting to depreciate an artist whose genius so far tran-

sceded their own. But posterity has elevated the painter "that saw the manners in the face" to a position which few others of his class or country have occupied. The greater part of his pictures, notwithstanding the broad touches of humor by which they are relieved, are in no respect caricatures in the present sense of the term, but strong and masculine satires, in which the vices of a corrupt age are drawn with a relentless keenness analogous to that of Juvenal. Some of the most masterly, like the series of "Marriage à la Mode," the "Rake's Progress," or the "Harlot's Progress," have even been called epical from their development of story, manners, character, and passion; and all of them are strictly historical, and therefore of high value, as representations of the manners of the age. In the words of Thackeray: "We look, and we see pass before us the England of a hundred years ago." Every rank in life and almost every pursuit; the frivolous dissipations of the rich, the vices and debaucheries of the poor; the dress, manners, habits, and even the thoughts of the time; the streets, squares, and buildings of London at all times of the day and of the year—all are reproduced with a minuteness and fidelity that rival the photographer's art. The moral which many of Hogarth's works are designed to inculcate is as simple and downright as his character. A man of sturdy independence and great determination, plain-spoken, jovial, and kindly, and brimful of national prejudices, among which contempt of Frenchmen and every thing foreign predominated, he presents a true type of the old-fashioned Englishman, and reflects in every picture his hearty English nature. Such a man could never risk the possibility of a doubt as to his meaning, but came to the point at once. Hence the characteristic of his satire is strength rather than delicacy, and we must seek for the peculiar evidences of his genius in the keen observation, the accumulation of minute and appropriate circumstances, the humor and the broad human nature which his works reveal. Their technical merits, the composition alone excepted, in which it is safe to say he has scarcely been approached, have been the subject of much unfavorable comment, and Walpole, adopting the prejudice of the time, has ventured to declare that Hogarth was no painter. So much indeed did he suffer under this imputation, that his profits were derived solely from the sale of his engravings, while the original pictures had to be disposed of by lotteries or otherwise for insignificant sums. It is a striking commentary upon the taste of the age that the 6 pictures of "Marriage à la Mode" were sold in 1744 for £19 6s., though 50 years afterward they brought £1,381. Modern critics, however, have declared that, with the single exception of the color, which Hogarth purposely subdued in order that the attention might not be diverted from his moral, these works are superior to most of the recent productions of English

painters. After the lapse of nearly a century from his death, the great painter of man and manners stands unapproached in his peculiar sphere—perhaps unapproachable; and posterity will willingly adopt the criticism of Charles Lamb: "Other pictures we look at; his prints we read." Of the various editions of his works, the best is that published by the Boydells (atlas fol., London, 1790), the original plates of which, retouched by Heath and others, have been issued in 3 subsequent editions, that of Bohn (London, 1848) being the last. Another edition in atlas folio, containing Hogarth's works reengraved by Thomas Cook, was published in London in 1802, but is far inferior to that of the Boydells. The best 4to. edition is that edited by Nichols and Steevens (3 vols., London, 1808-17), with letterpress illustrations. New editions of his works appeared recently in Leipsic and Stuttgart. The "Analysis of Beauty," in which he is said to have been assisted by Dr. Benjamin Hoadley and Dr. Morell, was reprinted in 1810; it has been translated into German, French, and Italian.

HOGG, JAMES, better known as the Ettrick Shepherd, a Scottish author and poet, born in the parish of Ettrick on the river of that name in Selkirkshire, Jan. 25, 1772 (according to his own statement, although the parish register records his baptism as having taken place Dec. 9, 1770), died Nov. 21, 1835. He was descended from a family of shepherds, and his youth and early manhood were devoted to the same occupation. He probably never received a year's schooling in the course of his life, but was fortunate in having a mother who loved the old ballads and border minstrelsy of Scotland, which she was in the habit of repeating to her children. These fastened upon his imagination, and while tending his flocks he imbibed at once a taste for poetry and the desire to become a poet. It was not until he was about 24 or 25 years of age that he began to compose verses, and his earliest efforts were seriously frustrated by his imperfect penmanship. He soon became known to the shepherds and farmers of the neighborhood as "Jamie the Poeter," and in 1800 a song of his entitled "Donald MacDonald," written under the apprehension of an invasion of the kingdom, obtained great popularity, although the name of the author was not known. From Whitsunday, 1790, to Whitsunday, 1799, he was in the employ of Mr. Laidlaw of Blackheath, who gave him free access to his library; and by the age of 30 Hogg had repaired the defects of his early education by a tolerably full course of reading. In 1801, while on a visit to Edinburgh to sell sheep, he was even tempted to publish a small collection of his songs, under the title of "Scottish Pastorals, Poems, and Songs." In the succeeding year Sir Walter Scott, while exploring the border counties for materials for his "Minstrelsy of the Scottish Border," met with Hogg, who furnished him with a number of old ballads, and in whom he manifested a strong interest. It was at the instigation of

Scott that in 1807, to repair his losses in an attempt to start a sheep farm in the Hebrides, he published a second collection of poems entitled the "Mountain Bard," which brought him in several hundred pounds. With this sum he again attempted farming, was again unsuccessful, and in Feb. 1810, went to Edinburgh to follow the career of an author. For a year he barely supported himself by editing a weekly paper called the "Spy," and at the suggestion of his friends he set about a longer and more regular work than he had hitherto attempted. This was published in 1813 under the name of "The Queen's Wake," and at once obtained a popularity scarcely inferior to that of Scott's best metrical romances. It contains "Kilmeny," his most admired poem. Thenceforth his life was pretty equally devoted to literature and farming, the former being on the whole rather the more profitable occupation. By the kindness of the duke of Buccleugh he was presented with the rent-free life occupancy of the farm of Altrive Lake in the braes of Yarrow, where he might have lived prosperously had not ambition prompted him to rent a much larger farm adjoining, in attempting to manage which he was in a few years reduced to the verge of bankruptcy. He was all this time a frequent contributor to "Blackwood's Magazine," and the broadly drawn character of the "Ettrick Shepherd," which figures so prominently in the *Noctes Ambrosianæ*, contributed to the magazine by Wilson and others, made his name familiar to all parts of Great Britain and the United States. Hogg was at first rather disconcerted at the liberties taken with him by his friends in these papers, but finally relished the joke as much as any one. In 1831 he went to London to superintend the publication of some of his works, and was lionized in a style to which few literary men are accustomed. The public thought that a second Burns had descended from the Scottish hills, and the poet was engaged to banquets and entertainments weeks in advance, and often to three a day. He died, after a short illness, of dropsy, universally lamented. Among his principal works, in addition to those mentioned, are the poems of "Madoc the Moor," the "Pilgrims of the Sun," "Queen Hynde," "Jacobite Relics," &c.; in prose, "The Brownie of Bodsbeck," "Winter Evening Tales," "The Three Perils of Woman," "The Three Perils of Man," the "Altrive Tales," &c.

HOGSHEAD, an old English measure of capacity of 63 wine gallons. For ale, beer, and claret, it possessed in Great Britain different values. For liquids it is in the United States the same as the English wine hogshead. When used for tobacco, the Kentucky, Missouri, and Virginia hogshead contains a mean net weight of 1,200 lbs., that of Maryland 800 lbs., and of Ohio 750 lbs.

HOGUE, LA. See CAPE LA HAGUE.

HOHENLINDEN, a village of Bavaria, in the circle of Upper Bavaria, 20 m. E. of Munich, memorable for a battle, Dec. 3, 1800, between

the French under Moreau and the Austrians under the archduke John. The village stands on the skirt of a thick wood, through which runs the road from Munich to Mühldorf. Moreau, having ascertained that the Austrians were advancing upon this road in the direction of Munich, disposed his forces along the edge of the wood on the Munich side, and sent Richepanse with a detachment to fall upon the enemy's flank while entangled in the forest. When the imperialists, anticipating no resistance, reached the point where the road emerges upon the open plain, the head of their column was attacked by Grouchy's division, and a desperate conflict took place, the Austrians endeavoring to debouch from the defile and extend themselves along the front of the wood, and the French striving to force them back. The snow fell so thickly that the hostile armies could not see each other, and the firing of each was directed by the flash from the guns of the opposite party. Meanwhile the division of Richepanse was intercepted by the right wing of the Austrians, which was advancing through the forest by another road, and was divided into two parts. The van, however, pressed on, and falling upon the main body of the Austrians while the struggle with Grouchy's regiments was still going on, completed their discomfiture. The imperialists were routed with terrible loss, and all their artillery fell into the hands of the victors. The Austrian right wing, which had emerged from the wood and was engaged against Grenier's division with not a little prospect of victory, retreated at the news of the overthrow of the main body, and was almost cut to pieces in the defile. The rear of Richepanse's division had continued to maintain itself against superior numbers, and was now rescued by its victorious comrades. By night the French had driven their enemy through the forest at all points, and compelled them, after losing 14,000 men and 100 pieces of cannon, to withdraw across the Inn. About 65,000 men were engaged on each side. The moral effect of this victory, the most decisive except that of Rivoli which either party had gained during the war, was still more disastrous to Austria than the actual loss which she suffered. It left her army without resources, and after one or two less important engagements an armistice was agreed upon three weeks afterward.

HOHENLOHE - WALDENBURG - SCHILLINGSFURST, ALEXANDER LEOPOLD FRANCIS EMMERICH, prince of, a Hungarian prelate, born in Kupferzell, near Waldenburg, Aug. 17, 1793, died Nov. 14, 1849. Having resolved, contrary to the wishes of his family, to enter the church, he studied theology at Vienna, Tyrnau, and Ellwangen, was ordained priest in 1815, and, after two years spent in the exercise of his functions at Stuttgart and Munich, visited Rome, performing before his return a pilgrimage to Loretto. In 1817 he was made ecclesiastical counsellor to the vicar-general of Bamberg, in 1824 canon of the chapter of Grosswardein, in

1829 provost of the same body, and in 1844 bishop of Sardica *in partibus infidelium*. In June, 1821, having been cured of a malady, as he supposed, through the prayers of a devout peasant named Martin Michel, he was induced to try the same means for the cure of the princess of Schwarzenberg, who was a paralytic. Having introduced Martin Michel into her presence, he instructed her to join him in prayer and faith. "The prayer finished," wrote the prince in his memoirs, "I felt, I never could explain how, something like a secret impulse which made me cry out to the princess: In the name of Jesus Christ, arise and walk. . . . The princess . . . was able not only to stand, which she had not done before for 8 years, but to walk." The fame of this reputed miracle soon spread all over Europe, and Prince Hohenlohe was constantly beset by sufferers under every sort of infirmity. He usually answered their applications through his secretary, instructing them to perform some special devotions, such as a retreat or a novena, to have a strong faith, and at a certain day and hour to join in prayers which he would then offer for their recovery. The most extraordinary cures are alleged to have taken place under these circumstances, always at the appointed hour. Many were reported in Great Britain and Ireland, and some in the United States. The case of Mrs. Ann Mattingly of Washington, D. C., who was said to have miraculously recovered of a tumor, March 10, 1824, in consequence of the prayers of Prince Hohenlohe, caused at the time a considerable excitement. The alleged miracles were regarded by Protestants as deceptions, but the Roman Catholics have generally believed them genuine, although they were not formally sanctioned by the pope. A biographer of Prince Hohenlohe relates that during the last year of his life 18,000 sick persons came to him for relief. He left several works, chiefly on the manner and efficacy of prayer, a defence of himself against the "Weimar Journal," and his *Mémoires et expériences* (8vo., Paris, 1835).

HOHENSTAUFEN, the name of a German family of princes, which ruled the German empire, with short interruptions, from 1138 to 1254. The name is derived from a castle on Mount Staufen in Württemberg, built by Frederic of Buren, one of the ancestors of the family. His son, known as Frederic of Staufen, was a staunch adherent of the emperor Henry IV. during his long struggles with the see of Rome and various rivals in Germany, and after the battle of Merseburg received the hand of his daughter Agnes, and the duchy of Swabia. This sudden elevation of the house, which from another possession in Swabia, Waiblingen, was also called Ghibelline, was the origin of its long struggle with the mighty rival family of the Guelphs. Of Frederic's two sons, Frederic II., the One-eyed, was confirmed by Henry V., the son and successor of Henry IV., in the possession of Swabia, while Conrad received Franconia. After the death of Henry, Conrad and Lothaire

of Saxony appeared as competitors for the imperial dignity, and the great power of the Hohenstaufen was the chief cause of the success of the Saxon. After the death of the latter (1137), however, Conrad, who had waged a long war against the emperor, the pope, and the Guelphs, ascended the throne of Germany as the third of that name. His nephew Frederic Barbarossa became his successor (1152-'90), who was succeeded by his son Henry VI. (died 1197). The son of the latter, Frederic, a child of 2 years, was not acknowledged as successor, and his uncle Philip, too, had to struggle against rivals, and was finally slain by Otho of Wittelsbach (1208). But soon after the young Frederic II. (1212-'50) rose in defence of his rights, and waged a gallant struggle against his enemies in Germany, as well as in Italy, where he had inherited from his mother Constance the Norman possessions. His son Conrad IV. died early in Italy (1254), where all the remaining male inheritors of the name of Hohenstaufen soon after perished in their struggle against Rome and the house of Anjou: Manfred, a son of Frederic II., in the battle of Benevento in 1266; Conradin, the young son of Conrad IV., on the scaffold at Naples in 1268; and Enzo, a natural son of Frederic, and the sons of Manfred, in prison. The possessions of the house were divided among various families, and now belong to Baden, Württemberg, and Bavaria. The principal work on the history of the family is Raumer's *Geschichte der Hohenstaufen und ihrer Zeit*.

HOHENZOLLERN, a territory of S. W. Germany, since Dec. 7, 1849, an administrative division of Prussia, but which previous to that date formed two small independent principalities of the Germanic confederation under the names of Hohenzollern-Hechingen and Hohenzollern-Sigmaringen, Hechingen and Sigmaringen being the capitals. The territory forms a long and narrow strip of land, surrounded by Württemberg, except on the S. W., where it is bounded by Baden; area, about 400 sq. m.; pop. 65,000. It is watered by the Neckar and some of its affluents, and by the Danube, which crosses it. Its mountains belong to the Rauhe Alps. Agriculture, cattle raising, and the manufacture of wooden ware are the chief occupations of the inhabitants. The Roman Catholic is the predominant religion. The territory derives its name from an old mountain castle near Hechingen. This was the original abode of the afterward princely house of Hohenzollern, to which the reigning dynasty in Prussia belongs. Count Thassilo (800) is mentioned as the most ancient progenitor of this house, which, after various divisions, finally ceded its possessions to Prussia, being unable to maintain its position after the storm of 1848-'9.

HOLBACH, PAUL HENRI THIRY D', baron, a French philosopher, born in Heidelberg, in the Palatinate, in 1723, died in Paris, Jan. 21, 1789. He was taken to Paris when very young by his father, from whom he inherited a considerable

fortune. A large part of this he expended in hospitalities to the free thinkers of his time, whom he regularly entertained at his splendid table, so that Galiani styled him the *premier maître d'hôtel de la philosophie*. The boldest opinions and the most irreligious principles were here discussed without restraint, D'Holbach himself being among the bitterest assailants of Christianity. He meanwhile published anonymously several atheistic and materialist works. His first, *Le Christianisme dévoilé, ou examen des principes et des effets de la religion révélée*, appeared in 1767 under the name of Boulanger, who had previously written his *Antiquité dévoilée*. Next came *L'esprit du clergé, ou le Christianisme primitif vengé des entreprises et des excès de nos prêtres modernes*, which a decree of parliament, Aug. 18, 1770, sentenced to be burned by the public executioner. The same year he published his most celebrated book, *Le système de la nature, ou des lois du monde physique et moral*, under the fictitious name of Mirabaud, *secrétaire perpétuel de l'académie Française*; this created such scandal that Voltaire himself thought proper to refute it in the article *Dieu* of his *Dictionnaire philosophique*, while Goethe declared that he recoiled from it in abhorrence as from a "cadaverous spectre." It passed, however, through 8 editions between 1817 and 1824, and a new edition in German was published in Leipsic in 1843. In 1772 a short pamphlet, *Le bon sens, ou idées naturelles opposées aux idées surnaturelles*, reproduced in a more familiar form the principles he had previously advocated; and this pamphlet, which has been frequently reprinted and largely circulated under the title of *Le bon sens du curé Meslier*, has more powerfully than any other publication contributed to diffuse the principles of infidelity among the middle classes in France. *Le système social, ou les principes naturels de la morale et de la politique*, appeared in 1773, and *La morale universelle, ou les devoirs de l'homme fondés sur la nature*, in 1776. Most of these works were, as soon as they appeared, proscribed by the church and the parliament, and were even disclaimed by philosophers. D'Holbach himself is said to have been a much better man than would be inferred from his books; he was genial, kind-hearted, and liberal. He rendered a service to science and natural philosophy by translating some valuable German works. In his literary performances he had the help of Lagrange, the teacher of his children, of Naigeon, to whose hands he confided all his works, and of Diderot.

HOLBEIN, HANS, or JOHANN, a German painter, born in Augsburg or Gründstadt in 1495 or 1498, died of the plague in London in 1554. He was the son of a painter of the same name (*Hans der ältere*) of considerable eminence during the latter half of the 15th century, and while a boy followed his father to Basel. He early manifested great ability in portraits and in compositions of an elevated religious character. About 1526 he contracted an intimacy with Erasmus, whose portrait he painted, and soon

after visited England, where he passed the remainder of his life. A letter from Erasmus recommended him to Sir Thomas More, who introduced him at court. Henry VIII. at once made him court painter, with a liberal pension, and thenceforth Holbein was intrusted with many commissions, chiefly for portraits, both from the king and the principal personages of the kingdom. He is distinguished as a historical painter, portrait painter, and engraver on wood. The painting in the Dresden gallery, representing the Virgin as queen of heaven, with the child in her arms, and the family of the burgomaster Jacob Meyer of Basel kneeling before her, is a noble specimen of his style. In the library at Basel is also a fine series of the "Passion of Christ" on panels. His portraits of Henry VIII. and four of his queens, Edward VI., Sir Thomas More and his family, the duke of Norfolk and his son Surrey the poet, Cromwell, Pembroke, and Somerset, are noted works; and so fully was he occupied while in England in painting portraits of eminent public characters, that he was compelled in a measure to abandon historical painting. Of his skill in executing large portrait pieces commemorating important public events two admirable specimens are preserved, the one representing Henry VIII. giving a charter to the company of barber-surgeons, now in surgeons' hall, London, and the other, Edward VI. giving to the lord mayor of London the charter for the foundation of Bridewell hospital. His pictures formerly in the royal collection have been widely dispersed; but soon after the accession of George II. a noble collection of original drawings by him was discovered in the palace at Kensington. As a colorist he possessed extraordinary merit, and his heads are distinguished by free and spirited design, by their surprising relief, and their fulness and force of expression. He painted in oils and distemper, and excelled in miniatures. As an engraver Holbein is chiefly known by the celebrated "Dance of Death," a series of 53 woodcuts engraved from his own designs, although it is seldom found with above 46, in which a terrible subject is treated with a bitter, ironical humor, and fantastic extravagance. This series has been frequently engraved, and the prints of Wenzel Hollar are particularly fine. It is mentioned of him that he used the left hand in painting.

HOLBERG, LUDVIG, baron, a Danish dramatist and historian, born in Bergen, Norway, Nov. 6, 1684, died in Copenhagen, Jan. 28, 1754. He lost his father when a boy, and was placed under the care of the bishop of Munthe, his relative, who caused him to be sent to the college of Bergen, whence at the age of 18 he went to the university of Copenhagen. He studied theology and languages, and, having passed his examination in 1705, visited Amsterdam, and taught for a while in Christiansand, he went to Oxford to study philosophy. Fifteen months afterward he had returned to Copenhagen, where, through some historical essays, he became connected with the university, the directors of

which commissioned him to examine and report upon the Lutheran schools of Holland. This mission led to further travel, and he visited Paris, Lyons, Marseilles, and Rome. Notwithstanding narrow resources and wretched health, he wandered about in whatever direction fancy or passing influences suggested. Returning at length to Copenhagen, he resumed the teaching of French and other languages; and in 1718 he was appointed professor in the university, first of metaphysics, but ultimately of rhetoric (1720). He now wrote a mock heroic poem, called *Peder Paars*, a national satire, in imitation of the style of *Hudibras*, which passed through three editions in the course of a year and a half. Other satirical pieces followed immediately, which were also successful, but which created for their author many enemies. He gave his attention next to a work upon the ecclesiastical and civil constitution of Denmark and Norway. Toward the close of 1722, King Frederic IV. undertook to found a national theatre. Previously there had been in Copenhagen no other dramatic representations than those of a troupe of French players who enjoyed the exclusive privilege of giving comedies, ballets, and puppet shows, or of occasional strolling companies who gave representations of legends of the middle ages. The king sent for a famous French actor, named Montaignu, to teach the national players the art of declamation. The first representation was given in 1722. Holberg now first conceived the plan of a comedy; and in a few weeks his "Political Tinman" was produced. He was thus the true founder of the Danish theatre, and the kingdom rang with his name. The first comedy was received with unbounded applause; and at very short intervals 14 other pieces were composed and played with increasing success. His patron Frederic was succeeded in 1730 by King Christian VI., a prince whose excessive religious zeal led him to forbid theatrical entertainments; but there had been time enough for Holberg's "Sleeper Awakened," "John of France," "Lying-in Chamber," "False Savant," and others, all pictures in caricature of the manners of the Danish middle classes, to be stamped indelibly upon the public mind. With a well filled purse, and a reputation by no means confined to Denmark, he set out anew upon foreign travel. Returning to Copenhagen, he wrote a satirical romance in Latin (1741) called the "Subterranean Travels of Nicholas Klim," which was translated into many languages immediately after its appearance; and a history of Denmark, which is valued equally with his epistles, fables, and epigrams, and only less than his dramas. Christian V. died in 1746, and his successor Frederic V. lost no time in restoring the theatre, and after a long silence Holberg saw his comedies again delighting the audience. He was rewarded by the new king with a patent of nobility, and lived until 1754, the delight of his countrymen. He had never married, and bequeathed his property chiefly to an academy

which had been founded at Sorøe by Christian IV. for the education of young noblemen. He gave 16,000 crowns as a fund to portion a number of Danish young women. As a dramatic writer Holberg evinced great comic originality. His wit was animated and refined, inventive and subtle. The "False Savant," a satire upon pedantry, is considered one of his most admirable works. There is discoverable in all his performances a moral purpose which even his wildest extravagances do not conceal. His delicate health rendered him occasionally hypochondriacal. His manners and habits were those of a methodical and reflecting man; and he preferred the society of women to that of his own sex, on the score of greater honesty and originality in conversation. His "Thoughts on the True Cause of the Greatness of Rome," and "Moral Reflections," are much extolled. A collection of his works in 27 vols. appeared at Copenhagen in 1826. He left an "Introduction to Universal History" in Latin, translated into English by Gregory Sharpe, LL.D. (8vo., London, 1755), and his autobiography, an English translation of which also appeared in London in 1830. A Holberg association was established in Copenhagen in 1842, under whose auspices a critical edition of his comedies was prepared by Liebenberg (Copenhagen, 1843-'7).

HOLBROOK, JOHN EDWARDS, M.D., an American naturalist, born in Beaufort, S. C., in 1795. He early removed with his parents to Massachusetts, was graduated at Brown university in 1815, received his medical diploma from the university of Philadelphia, and soon after went abroad to continue his professional studies in London and Edinburgh. He spent two years in Italy, Germany, and Paris, where he resided in the *jardin des plantes*, of which he is an *élève*. He returned to South Carolina, established himself in Charleston in 1822, and in 1824 was chosen professor of anatomy in the medical college of South Carolina, a chair which he still occupies. His most important work is the "American Herpetology, or a Description of Reptiles inhabiting the United States" (5 vols., Philadelphia, 1842). The difficulties in the preparation of the work were increased by the lack of museums in this country for the comparison of specimens, and of libraries for reference. Yet the "Herpetology" of Dr. Holbrook is the foundation of that branch of natural history in America. His descriptions are remarkable for clearness and precision, and the figures of the animals are correct and finely colored, being all, with one or two exceptions, drawn from living specimens. He began a work on "Southern Ichthyology," which was discontinued after two numbers, the field being too extensive for his survey, as he made all his drawings from life. He has since been employed on the "Ichthyology of South Carolina" (Charleston, 1854 *et seq.*), 10 numbers of which have appeared.

HOLCROFT, THOMAS, an English novelist and dramatist, born in London, Dec. 10, 1745, died March 23, 1809. His father was a shoe-

maker by trade, who, having served some time as a groom, owned several horses, and added to his income by letting them. His mother dealt in greens and oysters. He passed his early life in London and in Berkshire, following the same occupations pursued by his father. He was afterward in the service of a trainer of race horses at Newmarket, then a schoolmaster, and then an actor, picking up in these varied modes of life considerable knowledge and a kind of education, including some acquaintance with the French, German, and Italian languages. He had but moderate success as an actor in Ireland and in England, and soon abandoned the stage for the profession of a dramatic author, writing some original plays and some translations from the French. The most popular of his dramatic compositions is the "Road to Ruin" (1792), which still keeps its place upon the stage. In 1789 he lost his son, and in the following year his third wife. At the time of the French revolution he was a zealous advocate of the popular cause, incurring the suspicions of government as a member of the society for constitutional information, and with Horne Tooke, Hardy, Thelwall, and others, was in 1794 indicted for high treason. Some of the accused were acquitted, and Holcroft was discharged with others, without being brought to trial. He wrote some 30 plays and 4 novels: "Alwyn" (1780), "Anna St. Ives" (1792), "Hugh Trevor" (1794), and "Bryan Perdue" (1805). He published translations of Lavater's "Physiognomy," and the works of Frederic the Great; and "Travels in France and Germany" (2 vols. 4to., 1806). He was the first who introduced the modern melodrama upon the British stage. He paid much attention to the fine arts, and attempted to write an opera. His "Memoirs," written by himself and edited by Hazlitt, were published in 3 vols. 12mo. (London, 1816).

HOLDER. The law merchant, which is now a part of the common law of the country, gives to the *bona fide* holder of negotiable paper certain important rights, and imposes upon him certain duties; and it has rules by which it determines who is such a holder as to be entitled to those rights. In general, it may be said, that he is one who has lawful possession of the paper, with a right to demand payment from any persons bound to pay the note, and with an obligation of giving the notices to which the persons bound to pay are entitled. (See *NEGOTIABLE PAPER*.)

HOLDICH, JOSEPH, D.D., an American clergyman and author, born in Thorney Fen, Cambridgeshire, England, about 1800. His father was a scientific farmer, and during the latter part of his life was editor of the "Farmer's Journal and Agricultural Advertiser." Being partial to the United States, where he spent several years of his early life, he sent his son Joseph across the Atlantic for the purpose of finishing his education and studying law. The son was, however, led to devote his attention to theology, and in 1822 was admitted into the

Philadelphia conference of the Methodist Episcopal church. In 1826 he made a visit to England. In 1835 he was elected professor of moral science and belles-lettres in the Wesleyan university at Middletown, Conn., where he remained until 1849, when he was elected one of the secretaries of the American Bible society, which office he still holds. In connection with his duties as secretary he edits the "Bible Society Record," a monthly publication. He is the author of "Bible Questions," "A Bible History," "Memoirs of the Rev. Aaron H. Hurd," and the "Life of Wilbur Fisk, D.D.," president of the Wesleyan university.

HOLINSHED, HOLINGSHED, or HOLLYNSHED, RAPHAEL, an English chronicler, born in the first half of the 16th century, died about 1580. He probably received a university education, and is supposed to have taken orders, although the latter point is doubtful. Little else is known of his life. The "Chronicles of England, Scotland, and Ireland" (2 vols. fol., London, 1577), with which his name is connected, although the whole work was not written by him, is a monument of his industry and learning. Holinshead's share of it comprises the histories of England and Scotland, the latter being for the most part a translation from the Latin of Hector Boëthius. The other portions were done by Stow, Harrison, Hooker, and others. The 2d edition containing matter added by Thynne, which was offensive to Queen Elizabeth, means were taken to suppress certain sheets in that edition, which were restored in that of 1807. The value of the materials which it embodies renders the work indispensable to the student of early English annals.

HOLKAR, the name of a powerful Mahratta family which now holds the territory of Indore in Hindostan. Mulhar Row Holkar, the first of the name in history, born in 1693, abandoned the life of a shepherd in the Deccan to become a soldier, and, distinguishing himself in battle against the nizam-ul-mulk, was taken into the service of the peishwa, and gradually rose to be one of the most illustrious of the Mahratta leaders. The peishwa made him large grants of territory, and in 1733 gave him the town and district of Indore. He was one of the Mahratta generals at the battle of Paniput with the Afghans, in 1761. He died in 1766, and was succeeded by his grandson, who died insane after a few months, leaving the sovereignty to his mother Alia Bae. After the death, in 1797, of one Tookajee Holkar, to whom she had committed the command of her forces, Jeswunt Row Holkar, an illegitimate son of Tookajee, got possession of Indore, but was defeated and expelled by the Sindia family, another branch of the Mahrattas. Employing European officers to discipline his army, he was able in 1802 to recover his possessions; but taking advantage of a season of prosperity to indulge in an enormous system of plunder, he drew down the vengeance of the British. He defeated the first detachment sent against him, and in Aug. 1804,

at the head of 60,000 horse, took the city of Muttra and advanced upon Delhi. Here, however, he was routed by Lord Lake and pursued to Furruckabad, where he was again defeated. In 1805 he entered the Panjab with a fresh army, closely followed by Lord Lake, and in December concluded a treaty with the British at Umritsir, by which he retained nearly all his possessions. He murdered Kasi Row, the legitimate son of Tookajee Holkar, and Kundi Row, the child of another legitimate son, and died insane in 1811. He was succeeded by his mistress Toolsee Bye, acting as regent for Mulhar Row Holkar, the natural son of Jeswunt by another woman. The regent was assassinated in 1817, and young Mulhar was seized by the army, who began hostilities with the British under his ostensible command. A treaty was concluded, however, Jan. 18, 1818, soon after a decisive battle at Mahidpoor, by which the Mahrattas ceded a large part of their possessions, and retained the rest under British protection. Mulhar Row died in 1833, and was succeeded by a distant relative, Martund Row Holkar, who was dethroned to make room for Hurree Row Holkar, an imbecile prince who left his sovereignty to an adopted son, Kundee Row Holkar. The last died soon afterward without heirs, and the East India company thereupon assumed the right of nominating as his successor the young Mulkerjee Row Holkar, with the stipulation that inheritance by adoption should no longer be recognized. During his minority the rajah was educated under the auspices of the British government, and displayed remarkable ability. He assumed the reins of government on coming of age in Feb. 1852. When the mutiny broke out in 1857 he hastened to take the field for the British, but his troops deserted him and held him virtually a prisoner for some days in his own palace.

HOLLAND, KINGDOM OF. See **NETHERLANDS**.

HOLLAND, a province of the kingdom of the Netherlands, divided into North Holland and South Holland, and lying between lat. 51° 40' and 53° 10' N., and long. 3° 56' and 5° 30' E.; area, 2,094 sq. m.; pop. in 1858, 1,166,774. It has a low flat surface, in many places below the level of the sea, and protected from inundation by enormous dikes. The soil is marshy, and better adapted to pasturage than to cultivation. Tillage, however, is conducted with great care and patience. An excellent kind of flax, barley, oats, orchard fruits, and garden vegetables, are the principal crops. Dairy farming and the raising of sheep and cattle are carried on very extensively. The *polders*, or lands which have been recovered from the sea or lakes by draining, are among the most remarkable features of the country. Those of Beemster and Haarlem are the largest. Timber is scarce throughout the province.—North Holland is bounded N. and E. by the Zuyder Zee, S. E. by Utrecht, S. by South Holland, and W. by the North sea; area, 928 sq. m.; pop. in 1858, 544,789. It comprises several

islands in the Zuyder Zee and at its entrance, one of which, Texel, is 13 m. long by 5 broad. The river Y, on which Amsterdam is built, extends into the territory from the Zuyder Zee, and reaches almost to the North sea. The Helder ship canal connects this inlet with the strait that separates Texel from the mainland; it is 120 feet wide, 25 feet deep, and 50 m. long. The principal rivers are the Amstel, Vecht, and Zaan, and the chief towns, Amsterdam, Haarlem, and Alkmaar.—South Holland is bounded N. by North Holland, E. by Utrecht and Gelderland, S. by the Meuse, separating it from North Brabant, W. and N. W. by the North sea; area, 1,166 sq. m.; pop. in 1858, 621,985. Its S. part is cut up into several islands by the mouths through which the Meuse finds its way to the sea. The other rivers are the Old Rhine, the Yssel, and the Lech. The Hague, Rotterdam, Leyden, Delft, Dort, and Briel, are the most important towns.

HOLLAND, EDWIN CLIFFORD, an American poet and essayist, born in Charleston, S. C., about 1793, died Sept. 11, 1824. He was educated for the bar, but preferred a literary career, published a volume of poems in 1813, afterward edited a newspaper, the Charleston "Times," and wrote for magazines, and in 1818 dramatized the "Corsair" of Lord Byron. As a pamphleteer and controversialist he became a sort of local terror, and sustained a sharp controversy with Bishop England. He was associated with William Crafts and Henry J. Farmer in editing the "Omnium Botherum," intended to satirize the "Omnium Gatherum," edited by Thomas Bee.

HOLLAND, SIR HENRY, an English physician, born in Knutsford, Cheshire, Oct. 27, 1788. He was graduated at the university of Edinburgh in 1811, shortly after which he made a tour through Greece and the Ionian isles, of which he published an account in 1815. Upon his return to England he established himself in London. In 1852 he became physician in ordinary to the queen, and in 1853 was made a baronet. He is the author of several medical treatises, the most important of which is his "Medical Notes and Reflections," which has been reprinted in the United States. In 1834 he was married, for the 2d time, to Saba, daughter of Sydney Smith.

HOLLAND, HENRY RICHARD VASSALL, baron, an English statesman and author, born at Winterslow house, Wilts, Nov. 21, 1773, died at Holland house, Kensington, Oct. 22, 1840. He was the son of Stephen Fox, 2d Lord Holland, and nephew of Charles James Fox. He succeeded to his father's title when a little more than a year old, and was educated at Eton, and subsequently at Oxford, where he was graduated in 1792. In 1793 he travelled extensively over Spain, making himself familiar with the language and literature of the country, and subsequently visited other portions of the continent. He returned to England in 1796, and was married in the succeeding year to Lady Web-

ster, with whom he had formed an intimacy in Italy which induced her husband, Sir Godfrey Webster, to procure a divorce. On this occasion he took by royal license the surname of Vassall, which was that of his wife's family, in lieu of his patronymic of Fox; but his children have retained the latter name. In 1798 he made his first speech in the house of lords, and thenceforth was a frequent participator in debates, being to the close of his life a steady and consistent whig. Between 1802 and 1805 he made another long visit to Spain, and in 1806 he was appointed joint commissioner with Lord Auckland to arrange with Messrs. Monroe and Pinkney, the American commissioners, the matters of controversy between England and the United States. In October of that year he entered the cabinet as lord privy seal, a position in which he was succeeded in March, 1807, by the earl of Westmoreland, who came in with the duke of Portland. In the long interval of tory ascendancy Holland remained out of office, but upon the accession of the whigs to power in 1830 he again entered the cabinet as chancellor of the duchy of Lancaster, which office he retained almost uninterruptedly until his death. In 1806 he published "Some Account of the Life and Writings of Lope Felix de Vega Carpio," of which a 2d edition was issued in 1817, containing in addition a notice of Guillen de Castro and other matter. This work, the fruit of its author's visits to Spain, without aiming at profoundness, treats the subject in a genial and appreciative manner, and is commended by Mr. Ticknor and other authorities on Spanish literature. It was followed in 1807 by "Three Comedies from the Spanish," and in 1808 he edited, with a long preface, Mr. Fox's fragment entitled "A History of the Early Part of the Reign of James II." Since his death have appeared his "Foreign Reminiscences" (8vo., London, 1850; new ed. 1851), a work full of gossip and scandalous anecdotes; and the first two volumes of "Memoirs of the Whig Party during my Time, by Henry, Lord Holland" (London, 1854, edited by his son), which is of a character inferior to that of his earlier works. A publication entitled the "Opinions of Lord Holland, as recorded in the Journals of the House of Lords from 1797 to 1841," appeared in London soon after his death, affording a complete view of his public career. He had projected a life of his uncle, but never advanced beyond the collection of a few notes and materials, which are included in Lord John Russell's "Memoirs and Correspondence of Charles James Fox." Lord Holland was much esteemed in private life for his courtly grace of manner, genial humor, and amiability; and Holland house, his suburban residence, a building having many interesting historical associations, and stored with much that was rare and beautiful in art or literature, was for nearly 50 years the resort of eminent personages, and the scene of elegant hospitality. Although in mental calibre inferior to Charles James Fox, to whom he bore a strong

family resemblance, he was an effective speaker, and, according to Macaulay, was more distinguished in debate than any peer of his time who had never sat in the house of commons.

HOLLAND, JOSIAH GILBERT, M.D., an American author and journalist, born in Belchertown, Mass., July 24, 1819. Having practised medicine for a short time, and afterward edited a literary journal for a few months, he passed a year in Vicksburg, Miss., as superintendent of its public schools. In May, 1849, he became associate editor of the "Springfield Republican," Mass., with which he is still connected. He has published: "History of Western Massachusetts" (2 vols. 12mo., Springfield, 1855); "The Bay Path," a novel (New York, 1857); "Timothy Titcomb's Letters to the Young" (New York, 1858); "Bitter-Sweet," a dramatic poem (New York, 1858); and "Gold Foil hammered from Popular Proverbs" (New York, 1859). He has contributed to various magazines, and is known as a public lecturer.

HOLLAND, SIR NATHANIEL DANCE, an English artist, born in London in 1734, died in Winchester in 1811. He was the son of George Dance, the architect of the mansion house in London, and early devoted himself to painting, passing 8 or 9 years in Italy in the study of his art. On his return to England he distinguished himself as a painter of portraits, of which that of Garrick as Richard III. affords a good example, and also of history and landscape. By his captivating figure and address he was enabled to secure the hand of Mrs. Dummer, a wealthy Yorkshire heiress, after which he relinquished painting as a profession, assumed the name of Holland, was made a baronet, and entered parliament. He did not altogether abandon his art, but exhibited occasionally as an amateur.

HOLLAR, WENZEL, a Bohemian engraver, born in Prague in 1607, died in London, March 28, 1677. At 18 years of age he produced his plates of the "Virgin and Child" and the "Ecce Homo." In 1636 he attracted the attention of the earl of Arundel, the British ambassador to the German emperor, who took him in his suite to England. He now practised his art with great reputation and success, and executed portraits of the royal family and of the earl of Arundel, beside views of places, and a set of 28 plates, entitled *Ornatu Muliebris Anglicanus*, representing the dresses of English women of all ranks and conditions in full length figures. Under the commonwealth he joined the earl of Arundel in Antwerp, where he passed several years. During this period he engraved Holbein's "Dance of Death" and other works of the old masters. He returned to England in 1652, but in the latter part of his life he became reduced to great indigence. His prints, amounting to nearly 2,400, many of which were of small size executed for the booksellers, who paid him at the rate of fourpence an hour, are now highly esteemed for their delicate, firm, and spirited execution.

HOLLARD, HENRI, a Swiss physician, born

in Lausanne in 1801, has written extensively on the natural sciences. His principal work, *Étude de la nature* (1843; new ed. 1853), received a prize of 1,500 francs from the society of Christian morals. In his work *De l'homme et des races humaines* (1853) he endeavored to reconcile the developments of science with the Scriptures. He has also prepared manuals relating to general and comparative anatomy, and other scientific works.

HOLLEY, HORACE, LL.D., an American clergyman, president of Transylvania university, Ky., born in Salisbury, Conn., Feb. 13, 1781, died at sea, July 31, 1827. He was graduated at Yale college in 1803, in 1805 was ordained as minister over a parish in Fairfield, and in 1809 became minister of the Hollis street church in Boston. In 1818 he accepted an invitation to the presidency of Transylvania university, where he continued till 1827, when he resigned his office, with a view to taking charge of a seminary to be opened in Louisiana; but he was attacked by sickness in New Orleans in the summer of the same year, and died of yellow fever on his passage to New York. When first settled in Connecticut he was a Calvinist, but became a Unitarian. His memoirs were published by his widow.

HOLLIDAYSBURG, a post borough of central Pennsylvania, capital of Blair co., on Beaver Dam creek, a branch of the Juniata, 243 m. W. N. W. from Philadelphia; pop. in 1850, 2,430. It is a terminus of the E. division of the main line of the state canal, and also of the Alleghany Portage railroad, which here crosses the mountain. The cars were formerly drawn up to the summit on the E. side over 5 inclined planes, with an aggregate vertical altitude of 1,400 feet in a distance of 10 m. The descent on the W. side, also broken by inclined planes, is 1,151 feet in 26½ m. A branch railroad 8 m. long now connects the town with the Pennsylvania central railroad. The town is situated near the base of the Alleghany mountain, and has 8 or 9 churches, several founderies, machine shops, flouring mills, newspaper offices, and schools. It is the centre of a large trade by railroad and canal, having most of the forwarding business of a rich surrounding country abounding in agricultural and mineral resources. The iron of the Juniata region and large quantities of anthracite coal and grain are exported through this town. Hollidaysburg was incorporated in 1836. Gaysport on the opposite bank of the river, with which it is connected, is a borough of 1,000 inhabitants.

HOLLIS, THOMAS, a benefactor of Harvard college, born in England in 1659, died in London in 1731. He was for many years a successful merchant in London, and a bequest made to Harvard college in his uncle's will, of which he was trustee, first attracted his attention to that institution. Having made two considerable donations, he gave directions in 1721 for the employment of the fund, by which the Hollis professorship of divinity was constituted.

He was himself a Baptist, and the candidate for the professorship was required to be of "sound or orthodox principles." In 1727 he established also a professorship of mathematics and philosophy, and the net produce of his donations amounted at that time to £4,900. He also gave books for the library, and secured from a friend a set of Hebrew and Greek types for printing.—His nephew, Thomas Hollis, also gave money, books, and philosophical apparatus, and left a son, the 3d Thomas Hollis (died in 1774), an antiquary and virtuoso, whose donations to the college amounted to nearly £2,000.

HOLLY (*ilex*, Linn.), a plant of the natural order *aquifoliaceæ*, which embraces many species of trees or shrubs with small, axillary, 4 to 6-parted flowers, berry-like drupes containing 4 to 6 ribbed, veiny, or one-grooved nutlets, and simple alternate leaves. The common or prickly leaved holly of Europe is the *I. aquifolium* (Linn.), indigenous to most parts of that continent. It is a handsome, conical, evergreen tree, growing in its wild state to the height of 30 feet, and to twice that height or even more under cultivation. Loudon in his "Arboretum" records specimens of the common holly, grown in the environs of London, which attained the height of 25, 33, 40, and even 50 feet; and one in Surrey that was 80 feet. Its leaves are oblong, shining, with spiny teeth, very prickly upon the lower branches, while they are entire or unarm'd upon the upper, or on very old trees; its flowers are nearly umbellate, of a white color, and appear in May; its fruit is red, ripening in September and remaining on the tree all winter. Several distinct varieties are known to gardeners, such as those with leaves that are narrower or broader, or thinner and flatter, or thick margined, or small and without prickles, or ciliate edged, or serrate margined, or curled and savagely spined, or entirely spineless; or that vary in color, as the white edged, golden edged, white spotted, golden spotted, silver or gold blotched; or the variety consists in the fruits being yellow, white, or crimson. The common holly has been long a favorite plant in Great Britain, being used in forming hedges for gardens. John Evelyn in the 17th century speaks of stout walls of holly 20 feet in height. In Scotland there is mention made of holly hedges 10 to 25 feet high, and from 9 to 13 feet in width. The value of the holly for this purpose consists in its durability and impenetrableness, in its bearing the shears, and in its freedom from insects. The holly is of slow growth, but this is compensated in the time it will survive; in France it has been known to stand two centuries. The wood of the common holly is very hard, white, and fine grained, susceptible of a high polish, and readily stained. The branches are used in England for embellishments at Christmas festivities, its lustrous leaves and red fruit being very attractive. The usual modes of propagation are by seeds and cuttings, the latter being generally taken from the lower portions of the tree; it can also be budded, or

grafted by the cleft process, whereby all the beautiful or peculiar varieties can be perpetuated. The American holly (*I. opaca*, Aiton) so nearly resembles the European type, that it has been supposed identical with or at least only a variety of it. It differs from the European chiefly in its foliage being less glossy, its berries less bright, and its nutlets less veiny. It is an evergreen, and grows to the height of from 20 to 40 feet. It ranges from Canada to Carolina, and may be used and propagated in the same manner as the common holly. The yaupon (*I. Cassine*, Linn.) is a handsome shrub, with alternate, perennial, glabrous, shining, coriaceous leaves, and globose, scarlet, 4-celled berries, growing abundantly near the ocean in the loose soil of Virginia and the Carolinas. The Dahoon holly (*I. Dahoon*, Walter) is a very handsome shrub from 4 to 12 feet high, with long virgate branches and red persistent berries; this grows also near the coast of Virginia and southward. The winterberry holly (*I. verticillata*, Gray) has deciduous leaves; but its abundant axillary scarlet berries, which are persistent, make it a highly ornamental shrub; it is common to the northward. The inkberry holly (*I. glabra*, Gray) is a low straggling bush, with slender branches, evergreen, shining, oblong leaves, and black round berries, common in the swamps of New England and southward, and much used to form the framework of winter bouquets. The mountain holly (*I. Canadensis*, Mx.) is to be found in wet swamps among other shrubs; it bears very small white flowers upon slender thread-like stalks, succeeded by pale crimson-colored berries of the size of peas, ripening in August. This shrub is the *nenopanthus* of Rafinesque, and ranges from Canada throughout New England, New York, and Michigan. In Brazil occurs the *yerba maté* or Jesuit's tea of Paraguay (*I. Paraguensis*), from which a favorite beverage is made. There are 3 kinds of Paraguay tea, but all prepared from the same plant, the differences consisting in the mode of curing the herb. The natives boast of the innumerable qualities the tea possesses; and in the mining districts its use is almost universal. Like opium, it produces some singular effects; it gives sleep to the restless, and spirits to the torpid.—It is asserted that the leaves of the common holly are as efficacious as Peruvian bark in the cure of intermittent fever; the root and bark are said to be emollient, resolving, expectorant, and diuretic; the berries, purgative and emetic. The bark and berries of *I. verticillata* possess in an eminent degree the properties of vegetable astringent and tonic medicines, along with antiseptic powers. The leaves of *I. Cassine* act as a gentle emetic. The leaves of *I. glabra* are sometimes used for tea, and are said to be similar to those of the Paraguay species; they furnished the "black drink" of the Creek Indians, used at the opening of their councils. Some Brazilian species are valuable diuretics and diaphoretics. The fruits of *I. macoucoua*, a native of Guiana, when unripe,

abound in tannin, and when bruised in ferruginous mud are employed in dyeing cotton fabrics; they act somewhat like galls.

HOLLY SPRINGS, the capital of Marshall co., Miss., situated on the Central railroad, 25 m. S. from the Memphis junction, and 210 m. N. from Jackson; pop. in 1855, about 3,500. It is the principal place in the N. part of the state, is pleasantly situated, and contains 4 superior academies, attended by an aggregate number of nearly 400 pupils, several churches and newspaper offices, and a bank with a capital of \$200,000.

HOLLYHOCK (*althæa rosea*, Linn.), a garden flower, a native of the East, probably introduced into England about 2 centuries ago. At what time the double and the multiplex-flowered varieties originated among cultivators would be difficult to determine. In Gerard's "Herbal" (1636) 3 sorts of hollyhocks are mentioned, of which one is called the double purple. The leaves of the hollyhock are usually heart-shaped, with 5 to 7 sharply defined lobes. From this character of outline they vary into such deeply incised edges as to appear palmate. According to Persoon, a species attributed to Siberia is called *A. ficifolia*, which agrees with the form of the leaf of well defined garden varieties. These two well marked sorts may be readily noticed in any garden where choice varieties are raised. The tendency to sport in producing different colors in their flowers has caused much attention to be directed toward them. As great a difference exists in the form of the entire plants as in that of the leaves. Those tall and stately kinds formerly so common, which grew 10 or 12 feet high, are seldom seen in the gardens of amateurs, having given place to the sorts with smaller stems. The finer kinds of hollyhocks as fancy flowers seem to have originated simultaneously in England, France, and Scotland, during the last few years. The dwarf varieties are planted in groups or clumps, and by employing the showiest a charming effect is produced. The culture of these plants is easy. New varieties are secured by cross impregnation, collecting the pollen from the finest sorts and conveying it to the stigmas of those flowers intended to be saved for seeds. These evidently should be of the less multiplex kinds, so as at least to secure perfectly formed stigmas. Some such naturally seed freely, and when they are selected for this purpose they should be grown in rich soil; their best and most perfectly formed blossoms should be selected, thinning out the poorer ones and shortening the top of the spike. All the withered petals should be very carefully pulled away, so that they may not collect and convey dampness to the young and maturing seed vessel. Those seeds which are the first ripened may be sown the same year; otherwise they should be kept dry and sown in the succeeding spring. Generally a great variety in colors, size, and form will be the result of such a process. The choicer sorts may be preserved by cuttings taken from those young shoots which

are abundantly produced early in the spring, to be planted in a light sandy soil, shaded for a while, and covered from too much air; but when single eyes or axillary leaf buds are used, bottom heat will be found necessary. Another method, which is the commonest and easiest, is by division of the roots, which can be done a few days before or even at the time of planting out. Some varieties have been known to come true from the seed, but this is so rare that seed sowing cannot be relied on. The hollyhock will grow in almost any kind of earth, but to have choice blooms from the finer varieties a prepared soil will be found advantageous. In all cases the ground should not be too retentive of moisture, or of too close a texture.

HOLMAN, JAMES, known as "the blind traveller," born in England about 1787, died in London, July 26, 1857. He entered the royal navy in 1798, and 9 years afterward received a commission as lieutenant. In 1812 a disease contracted in the discharge of his duty destroyed his eyesight, and the king consequently appointed him one of the 6 naval knights of Windsor. During the years 1819-'21 he travelled through France, Italy, Savoy, Switzerland, and along the Rhine, and published an account of his impressions, which was so well received by the public that he set out in 1822 on a journey around the world. Commencing at St. Petersburg, he took the route by Moscow, Novgorod, and Irkootsk, intending, when the season should permit, to proceed through Mongolia and China; but being suspected as a spy, he was stopped by an order from the Russian government and sent back under escort to the German frontier, whence he returned to England in 1824. He published in 1825 an account of this journey, under the title of "Travels in Russia," &c. The 5 years from 1827 to 1832 he passed in a voyage around the world, of which he published an account in 1834. His route was from England to Madeira, Tenerife, and the west coast of Africa, thence to Brazil, which he passed some time in visiting, thence to Cape Colony, Caffraria, Madagascar, Mauritius, Ceylon and India, New South Wales, Van Diemen's Land, and New Zealand, returning by Cape Horn to England. He afterward, in 1843-'4, made a tour in the Danubian principalities and Transylvania. Lient. Holman's books are more curious from the circumstances under which they were written than useful.

HOLMES. I. A N. W. co. of Fla., bordering on Ala., and intersected by the Choctawhatchee river; area, 612 sq. m.; pop. in 1850, 1,205, of whom 163 were slaves. Its surface is nearly level. The soil is a rich alluvium in the river bottoms and sandy elsewhere. In 1850 it produced 23,880 bushels of Indian corn, 7,070 lbs. of rice, 114 bales of cotton, 9 hogsheads of sugar, and 1,050 gallons of molasses. There were 3 churches, and 20 pupils attending a public school. Capital, Cerro Gerdo. II. A central co. of Miss., bounded S. E. by Big Black river and N. W. by the Yazoo; area, 756 sq. m.;

pop. in 1850, 13,928, of whom 8,377 were slaves. It has an undulating surface and a very rich soil. The productions in 1850 were 543,155 bushels of Indian corn, 124,892 of sweet potatoes, 72,550 lbs. of rice, and 12,635 bales of cotton. There were 5 churches, 2 newspaper offices, and 1,090 pupils attending public schools. The Yazoo is navigable by steamboats in this part of its course during the whole year, and the New Orleans, Jackson, and great northern railroad passes through the county near its S. E. border. Capital, Lexington. III. A central co. of Ohio, intersected by Kilbuck creek and Walhonding river; area, 405 sq. m.; pop. in 1850, 20,452. It has a diversified surface and a soil of generally good quality. The productions in 1850 were 358,360 bushels of Indian corn, 294,677 of wheat, 207,336 of oats, 16,357 tons of hay, 138,633 lbs. of wool, and 457,901 of butter. There were 16 grist mills, 28 saw mills, 5 woollen factories, 11 tanneries, 37 churches, 3 newspaper offices, and 3,690 pupils attending public schools. Coal is found near Kilbuck creek, and gas springs have been discovered. The Cleveland, Zanesville, and Cincinnati railroad has been completed from Cleveland to Millersburg, the capital.

HOLMES, ABIEL, D.D., LL.D., an American clergyman and annalist, born in Woodstock, Conn., Dec. 24, 1763, died in Cambridge, Mass., June 4, 1837. He was the son of Dr. David Holmes, who served during the war in Canada for 3 campaigns, and on the breaking out of the revolution at once entered the continental army as surgeon, continuing in service until the 4th year of the war. At the death of his father, Abiel had attained his 16th year. He was graduated at Yale college in 1783, and became subsequently a tutor in the college, pursuing at the same time his theological studies. In 1785 he was settled over a parish at Midway, Ga., where he remained till compelled by ill health to resign his charge in 1791. In the preceding year he had married Mary, the daughter of President Stiles of Yale college, who died Aug. 29, 1795. After his return to the North he accepted an invitation to become pastor of the first parish in Cambridge, where a vacancy had been made by the death of the Rev. Mr. Hilliard; he was installed Jan. 25, 1792, and continued to fill the office till Sept. 26, 1832. Dr. Stiles at his decease had bequeathed to his son-in-law his large collection of manuscripts, containing researches upon various subjects, and to these Dr. Holmes gave his close attention, with a view to writing a "Life of President Stiles," which was published in 1798. The study of these papers turned his attention to the early history of America, which had been a subject of special interest to Dr. Stiles, who had collected a great mass of statistics and details relating to it. From this time Dr. Holmes devoted himself to the preparation of the work on which his literary reputation is chiefly founded, the "Annals of America" (2 vols. 8vo., Cambridge, 1805), which immediately established for its author a high

reputation for care and accuracy, and has ever since maintained its place as a leading authority in American history. It was republished in England in 1813, and in 1829 a new and enlarged edition was published in this country. Dr. Holmes contributed frequently to the collections of the Massachusetts historical society, in vol. xxvii. of which will be found a complete list of his publications. In 1817 he delivered a course of lectures upon the ecclesiastical history of the country, particularly of New England, which have not been published. In 1800 he married Sarah, daughter of the Hon. Oliver Wendell of Boston, who with 3 children still survives him.

HOLMES, ISAAC EDWARD, an American statesman, born in Charleston, S. C., April 5, 1796. He was graduated at Yale college in 1815, was admitted to the bar in Charleston in 1818, and became a successful practitioner. In 1826 he was elected to the state legislature, and became a leader in the councils of the nullification party, being the first to propose that the state should take measures of resistance to the protective tariff. He rejected, however, a test oath proposed by his party. In 1839 he was elected a representative in congress, in which office he remained till 1851, and was successively at the head of the committees on commerce and on the navy. Beside his labors in legislation and at the bar, he has published a volume of elaborate political essays, entitled "Carolinesis," designed to assert the rights of the states in their relations to the federal government. He also wrote the "Recreations of George Taletell," consisting of tales, essays, and descriptive narrative.

HOLMES, OLIVER WENDELL, M.D., an American physician and poet, son of Dr. Abiel Holmes, born in Cambridge, Mass., Aug. 29, 1809. He was graduated at Harvard college in 1829, and entered upon the study of the law, which however he soon abandoned for medicine, and in 1832 went to Europe to pursue his studies, passing several years abroad in attendance on the hospitals of Paris and other large cities. He received the degree of M.D. in 1836, and in 1838 was chosen professor of anatomy and physiology in Dartmouth college. Upon the resignation of Dr. John C. Warren in 1847 he was elected to fill the same chair in the medical college of Harvard university, which he still occupies, having abandoned the general practice of his profession. Early in his college life Dr. Holmes attracted attention as a poet. He contributed to the "Collegian," a periodical conducted by the undergraduates of the college, and also to "Illustrations of the Athenæum Gallery of Paintings" in 1831, and to the "Harbinger, a May Gift," in 1833. In 1836 he read before the Phi Beta Kappa society, "Poetry, a Metrical Essay," which was published in the first collected edition of his "Poems" (12mo., Boston, 1836); "Terpsichore" was read by him at a dinner of the same society in 1843, and "Urania" was published in 1846. In 1850

he delivered before the Yale chapter of the same society a poem entitled "Astræa," which was published in the same year. His poems have passed through many editions since they first appeared in a collected form, and have been republished at different times in England. In the "Atlantic Monthly" (Boston, 1857) he began a series of articles under the title of "The Autocrat of the Breakfast Table" (since published in a volume), which were continued for a year, and followed by "The Professor at the Breakfast Table." As a writer of songs and lyrics, Dr. Holmes stands in the first rank; many of his best poems are of this class, and have been written for social or festive occasions at which they have been recited or sung by the poet himself. Of patriotic lyrics few are likely to have a longer life than his stirring verses to "Old Ironsides." He is also popular as a lyceum lecturer. He has distinguished himself by his researches in auscultation and microscopy. In 1838 he published three "Boylston Prize Dissertations;" in 1842, "Lectures on Homœopathy and its Kindred Delusions;" in 1848, a "Report on Medical Literature," in the "Transactions of the National Medical Society;" a pamphlet on "Puerperal Fever;" and, in conjunction with Dr. Jacob Bigelow, an edition of Hall's "Theory and Practice of Medicine" (8vo., 1839). He has been a frequent contributor to the periodicals of his profession, as well as to the "North American Review," the "Knickerbocker," and other literary magazines. Dr. Holmes married a daughter of the late Hon. Charles Jackson of Boston, where he resides.

HOLOCAUST (Gr. *ὅλος*, whole, and *καίω*, to burn), a kind of sacrifice in which the entire offering was consumed by fire, as an acknowledgment of divine supremacy, and claim to all honor and worship. In the Bible it is called a burnt offering. Sacrifices of this sort were known among the heathen, and were in use long before the institution of the other Jewish sacrifices by the law of Moses; and the Jews allowed Gentiles to offer holocausts on their altars by the hands of Jewish priests, although they did not permit them to offer any of the other Mosaic sacrifices.

HOLSTEIN (Lat. *Holsatia*), a duchy of the kingdom of Denmark, and a state of the Germanic confederation, bounded N. by the river Eider, which separates it from Schleswig, E. by the Baltic, S. by the Elbe, which separates it from Hanover, and W. by the German ocean; area, 3,269 sq. m.; pop. in 1855, 523,528. Its surface is mostly level. The midland part, a plateau of sand, imperfectly drained, bears a resemblance to the peat flats and bogs of Hanover. The slopes to the Baltic, drained by the Schwentine and Trave, are well wooded. The other declivity, toward the Elbe and German ocean, is more gradual, but equally well drained by the Alster, Krukau, Stör, and Pinnau. The lowlands on the Elbe and on the W. coast are particularly fruitful; and of late years, owing to excellent tillage and the use of marl, the

same may be said of nearly the whole of the province. The products are wheat, buckwheat, vegetables (especially potatoes), hops, hemp, flax, and wood. Remarkably fine horses, famous for heavy cavalry service, are exported in considerable numbers, together with black cattle and butter. Salt and lime are found in the southern districts, in the neighborhood of Oldeslohe. The men are good seamen, and numbers of them are profitably employed in the Greenland seal and whale fisheries. Education is well endowed, there being good schools in the cities, a university in Kiel (founded in 1665), and a seminary for tutors in the same city, which, established in 1780, has been of great utility in advancing popular education. The religion is Lutheran, but other sects are tolerated. There are railway lines from Hamburg to Kiel and Lübeck, with a branch to Hanover. Altona and Kiel are the most important cities; the others are Glücksburg, the seat of government, a fortified place upon the Elbe at the mouth of the Stör, Rendsburg on the Eider, Stegeborg, Oldeslohe, Itzehoe, and Plön. The duchy is divided into 20 bailiwicks. In 1834 a constitution, uniting Holstein and Schleswig under a representative system common to the other Danish provinces, was granted by Frederic VI. Various modifications of this arrangement have in turn excited the jealousy and opposition of the Germanic diet; and the king of Denmark is diplomatically resisting the latest demonstration on the part of this body (1859).—The earliest history of Holstein is of its occupation by tribes of Saxons. In the 8th century they were conquered by Charlemagne; and after the extinction of the Billung dukes of Saxony, the country was bestowed upon Adolph of Schauenburg, with the title of count of Holstein. The descendants of this prince retained the inheritance for nearly 4 centuries, Schleswig in the mean time having been added (1386) to their possessions. The union of the two provinces has been continued with the exception of very short periods until the present day. The house of Schauenburg became extinct in 1459, when Christian I., king of Denmark, was elected count of Holstein by the diet of the province. It was stipulated, however, that Holstein should be independent of Denmark in government and in inheritance. In 1474 it was erected into a duchy by the emperor Frederic III., as a possession of Christian I., between whose two grandsons, Christian III. of Denmark and Adolph, it was subsequently divided (1544); hence the origin of the two principal branches of the ducal family. The elder of the two is still in possession as well of Denmark as of Holstein. The younger branch, whose share of the duchy was the castle and territory of Gottorp, and which became known as the house of Holstein-Gottorp, produced subsequently two other branches or royal lines; the senior of which, Holstein-Gottorp, is represented by the czar of Russia; and the younger, Holstein-Gottorp-Eutin, by intermarriage with the Swedish Va-

sas, is represented by the son of the exiled Gustavus IV. of Sweden, the present prince of Vasa. (See DENMARK.)

HOLT, a N. W. co. of Mo., separated from Kansas and Nebraska on the S., S. W., and W. by the Missouri river, and bounded E. by the Nodoway; area, 470 sq. m.; pop. in 1856, 5,404, of whom 279 were slaves. It has an undulating surface, with some bluffs on the Missouri river, and a fertile soil. The productions in 1850 were 240,347 bushels of Indian corn, 48,355 of wheat, 11,423 of oats, 870 tons of hay, and 11,607 lbs. of wool. There were 3 saw mills, 3 churches, and 330 pupils attending public schools. Capital, Oregon.

HOLT, Sir JOHN, an English jurist, born in Thame, Oxfordshire, Dec. 30, 1642, died in March, 1709. He was educated at Oxford, became a student of law, was called to the bar in 1663, and rose to great eminence as an advocate. In 1685 he was elected recorder of London, but was removed at the expiration of a year and a half in consequence of his opposition to the measures of the court. In the convention parliament which met to arrange the succession to the crown, after the departure of James II., he displayed so much ability that William III. appointed him in April, 1689, chief justice of the king's bench, which position he occupied until his death. In 1700 he was solicited to accept the great seal, upon the removal of Lord Somers from the office of chancellor, but declined. Of his integrity, courage, and firmness in the discharge of his duties, a traditional instance is related upon the occasion of a summons from the commons to appear at their bar, for deciding in favor of the Aylesbury burgesses, who had been committed for complaining about the illegal rejection of their votes. He took no notice of the first message from the house; and upon being summoned by the speaker in person, he told that officer to return at once to his chair, or he would commit him to Newgate. The reports of his decisions, compiled by his pupil and successor, Chief Justice Raymond, commencing with the Easter term, 6 William and Mary, give a good impression of his judicial abilities. Sir John Holt published in 1708 a folio volume of crown cases collected by Chief Justice Kelyng, with notes by himself, and 3 of his own decisions.

HÖLTY, LUDWIG HEINRICH CHRISTOPH, a German poet, born in Mariensee, near Hanover, Dec. 21, 1748, died in Hanover, Sept. 1, 1776. He studied theology at Göttingen, became acquainted with Bürger, Miller, and Count C. Stolberg, and was a member of the society of poets which they had formed. In 1773 he went to Leipsic, and in 1775 to Hanover to restore his health, which was greatly impaired. He was preparing a collection of his poems when he died. They were afterward edited by his friends Stolberg and Voss in 1783. He translated the philosophical works of the earl of Shaftesbury and other English works into German.

HOLY ALLIANCE, a league formed by the

emperors Alexander I. of Russia, Francis of Austria, and Frederic William III. of Prussia, after the second abdication of Napoleon, and acceded to by most of the other powers of Europe, excepting the holy see and England. Its ostensible object was to regulate the states of Christendom on principles of Christian amity, but the real aim was to maintain the existing dynasties. Alexander himself drew up the agreement and gave to it its name. The three monarchs signed it at Paris, Sept. 26, 1815, but it was not wholly made public till Feb. 2, 1816, when it appeared in full in the "Frankfort Journal." A special article of the treaty excluded for ever the members of the Bonaparte family from all the thrones of Europe. It was in virtue of the holy alliance that Austria in 1821 suppressed the revolutions in Naples and Piedmont, and that France in 1823 restored absolutism in Spain. After Alexander's death the compact lost much of its authority, and the French revolution of 1830 may be said to have ended it.

HOLY WATER, in the Roman Catholic church, water which has been blessed by a priest with various prayers and exorcisms, and with the admixture of salt. It is used in many of the church services, and is commonly placed at the doors of churches, that the faithful may sprinkle themselves with it on entering and leaving the sacred edifice. In many places it is customary for the priest to pass among the congregation and scatter it from a brush or sprinkler before mass. Catholics usually keep it in their houses, and beside its symbolical usage, as a memento of baptism, it is believed to have a peculiar efficacy in repelling devils. Baronius and others ascribe its origin to the apostles, but many Catholic writers refer it to a period as late as that of Pope Alexander I. In the Latin church it is solemnly blessed on the day before Easter. The Greeks perform the ceremony on Jan. 6, when they believe that Jesus Christ was baptized by St. John in the Jordan. Twice a year they drink holy water in the churches, viz., at the end of the midnight mass of Christmas and on the feast of the Epiphany.

HOLY WEEK, a name given in the Roman Catholic church to the week immediately preceding the festival of Easter, because she then celebrates the most sacred mysteries with solemnities of peculiar interest. It was anciently called the great or painful week, or week of sorrows. The ceremonies begin on Sunday, when Christ's entrance into Jerusalem is commemorated by blessing palm or other green branches and distributing them to the people, whence the day is called Palm Sunday. On the Wednesday, Thursday, and Friday evenings the office of the *Tenebræ* (darkness) is chanted. This consists of the matins and lauds for the following mornings, which it is customary to recite over night. During the service a large candlestick supporting 15 lights arranged in form of a triangle, which denote Christ and the prophets who predicted his coming, stands in the

sanctuary; the lights are one by one extinguished, until only the upper one remains, which is taken down and placed under the altar until the close of the office, and then brought back; this symbolizes Christ's burial and resurrection. On Thursday, sometimes called Holy or Maunday Thursday (from the word *mandatum*, commandment, with which one of the services begins), the institution of the Lord's supper is commemorated, and in some places the priests wash the feet of 12 poor persons, in imitation of the action performed by Jesus toward his apostles. It is done by the pope to 13 priests, though why the number should be 13 instead of 12 is not well understood. The bells are not rung nor instruments of music sounded from the *Gloria in excelsis* in the mass of Thursday until the same time on Saturday. A consecrated host is carried in procession to some temporary altar prepared for it, and kept there until the next day, when the priest carries it back to the main altar and consumes it. There is no mass on Good Friday, and the altar is stripped of all its ornaments. The ceremony of kissing the cross, sometimes called the adoration of the cross, is performed on this day by all the faithful. On Saturday the services begin by the blessing of fire and water, and of the paschal candle, an emblem of Jesus Christ, which is lighted in token of his resurrection, and burns during part of the mass from Easter until the Ascension. It was on the Saturday in Holy Week that the early church used to administer baptism to catechumens, and parts of the service still relate to this custom.

HOLYHEAD (Welsh, *Caer Gybi*, fort of Gybi), a parliamentary borough, market town, and seaport of N. Wales, on a small island of the same name at the W. extremity of the county of Anglesea; pop. in 1851, 5,622. An embankment $\frac{3}{4}$ of a mile in length, 16 feet high, with a bridge midway, through which the tide rushes with great violence, connects the island across a sandy shallow with the island of Anglesea. The town is irregularly built, but the houses are massively constructed of stone. The pier is of limestone, 900 feet in length, with 14 feet water at the head in low tides. A harbor and breakwater have been some years in construction, at the national expense, and is being formed by literally casting a mountain into the sea. Holyhead mountain, or Pen Caer Gybi, from which the materials are drawn, is a hill of limestone 700 feet high. The N. breakwater has been carried out 6,400 feet, the E. 2,500. Since the commencement in 1849 over 5,000,000 tons of stone have been used in the work, and upward of £500,000 expended on it. The harbor when completed will enclose 316 acres, with $6\frac{1}{2}$ fathoms depth of water. A considerable proportion of the population is employed in connection with these works, the remainder being mostly engaged in rope making, ship building, and the coasting trade. The parish church is an ancient structure, dedicated to St. Gybi, with some rude but curious carving on its walls, and

situated in a churchyard surrounded by a stone fence which appears to have been a Roman fortress. Holyhead unites with Amlwch, Beaumaris, and Llangefni, in sending one member to parliament. It is a terminus of the Chester and Holyhead railway.

HOLYOKE, a township of Hampden co., Mass., on the right bank of the Connecticut river, and on the border of Hampshire co., 9 m. N. from Springfield and 107 m. W. from Boston; pop. in 1855, 4,639. It is an important manufacturing place, owing its prosperity chiefly to the Hadley Falls company, incorporated in 1848, with a capital of \$4,000,000, for the construction of a dam across the Connecticut river at Holyoke. This work was completed in 1849. It is 1,017 feet long and built of timber, with solid masonry abutments at each end. The foundation and all the spaces between the timbers are filled in with stone to the height of 10 feet, and the structure has withstood the heaviest freshet ever known in the Connecticut river without damage or settling in any part. The water is admitted by 13 gates to a main canal faced with masonry, 140 feet wide at bottom, 144 at the top, and 22 feet deep, branching at a distance of $\frac{1}{2}$ of a mile from the river into 2 mill races, for the use of factories on different levels. The water from the upper race, after moving the mills on its proper level, is conveyed back to a point near the river, where it falls into the lower race. The motive power secured by these works is said to be the best in the United States. The principal manufacturing establishments are the Hampden cotton mills, commenced in 1853, with a capital of \$100,000; the Lyman cotton mills, commenced in 1854, capital \$1,470,000; the Parsons paper mills, commenced in 1854, capital \$60,000; and the Holyoke paper mills, commenced in 1857, capital \$50,000. In 1855 the value of goods manufactured was \$1,669,482, the production of which employed 1,998 hands and an aggregate capital of \$2,026,720. The village of Holyoke is regularly laid out on high ground W. of the canals. It is lighted with gas, supplied with water from the Connecticut by forcing pumps worked by hydraulic power, and has a large hotel. In 1858 the town contained 7 churches (2 Baptist, 2 Congregational, 1 Methodist, 1 Roman Catholic, and 1 Universalist), a bank, a savings bank, a high school, and a weekly newspaper office. The Connecticut river railroad passes through it.—Holyoke was originally part of Springfield. It was incorporated as part of West Springfield in 1786, receiving the name of Ireland parish, and became a separate township in 1850.

HOLYOKE, EDWARD AUGUSTUS, M.D., an American physician, and a centenarian, born in Essex co., Mass., Aug. 1, 1728, died in Salem, Mass., March 31, 1829. He was graduated at Harvard college, of which his father, Edward Holyoke, was president, in 1746, and began to practise as a physician at Salem in 1749. At his death he had practised in Salem for 79 years, and had never been 50 miles from that city.

He was married in 1755, and a second time in 1759, and was the father of 12 children, only two of whom survived him. He was reputed a skilful and learned physician, and was one of the founders and the first president of the Massachusetts medical society. He was temperate in his diet, eating freely of fruit; was accustomed to walk in his professional practice until his 80th year; and regarded his constant care to have a full proportion of sleep as one of the causes of his longevity. At 80 years of age he had lost his teeth, and his hearing and memory had begun to fail. Between the ages of 45 and 85 his sight required the aid of convex glasses; it gradually improved afterward, till at his death he could read the finest print with his naked eyes. On his 100th birthday about 50 of his medical brethren of Boston and Salem gave him a public dinner, when he appeared at the table with a firm step, smoked his pipe, and gave an appropriate toast. A memoir of his life was published by the Essex medical society.

HOLYROOD PALACE. See **EDINBURGH.**

HOLYWELL, a municipal and parliamentary borough and market town of Flintshire, N. Wales, near the left bank of the estuary of the Dee, and on the Chester and Holyhead railway, 15 m. N. W. from Chester; pop. in 1851, 5,740. It takes its name from the holy well of St. Winifred, formerly celebrated for its virtue in the cure of diseases. The well discharges 21 tons of water per minute, and now serves as the motive power of most of the machinery in the place. Margaret, countess of Richmond, mother of Henry VII., erected a handsome Gothic building over the spring, the upper part of which is now used as a school house. Holywell rose into consideration in the beginning of the present century, by the extension of the mines and the establishment of cotton mills, smelting houses, and foundries. In the vicinity are collieries, and valuable mines of lead, copper, and zinc. The chief manufactures are copper wire, bolts, nails, sheathing, white and red lead, shot, flour, and flannels. Limestone is largely exported. Holywell unites with Flint in sending one member to parliament.

HOMBURG, a German watering place, capital of Hesse-Homburg, about 9 m. from Frankfort-on-the-Main, with which city it is connected by railway *via* Bonamös, and beautifully situated on an eminence, which affords a delightful view of the Taunus mountains; pop. 5,000. It consists of a long main street, on one side of which are the wells and *Kursaal*, and at the end of the other the palace of the landgrave. The mineral springs were discovered about 1834, partly by boring Artesian wells, and are considered very beneficial in cases of disordered liver and stomach. The *Kursaal*, built by some French speculators, at a cost of \$100,000, is one of the most magnificent in Germany; it is decorated internally with frescoes and other works of art by Munich artists, and contains a saloon for musical assemblies, dining, coffee, and smoking rooms, and a reading room. It contains the

gambling tables, where large amounts are annually lost in play, and which furnish the chief source of revenue to the government. The efforts of the Frankfort parliament in 1849 to put a stop to gambling were unavailing. Homburg has become within the last few years a favorite resort of Russians and Englishmen and other visitors during the season. The gardens immediately attached to the palace were laid out in the style of English pleasure grounds by the late landgravine Elizabeth, daughter of George III.

HOME, SIR EVERARD, a Scottish surgeon, born at Greenlaw castle, Berwickshire, May 6, 1746, died Aug. 31, 1832. He studied medicine with his brother-in-law, the celebrated John Hunter, and afterward practised with great success in London for more than 40 years. In 1813 he was created a baronet and appointed sergeant surgeon to the king, in which office he was continued by William IV. He was also professor of surgery and anatomy, and for many years president of the royal college of surgeons. His "Lectures on Comparative Anatomy" (6 vols. 4to., London, 1814-'28) is his most important work, being a collection of his contributions to the "Philosophical Transactions." There seems to be little doubt that he is indebted for his reputation as an author to the folio volumes of minutes of dissections left by John Hunter, which he took from the Hunterian museum under the pretence of preparing a catalogue of the museum, and subsequently burned.

HOME, HENRY, Lord Kames, a Scottish jurist and author, born in Kames, Berwickshire, in 1696, died Dec. 27, 1782. He was educated in the law at the university of Edinburgh, and, after nearly 30 years' practice at the bar, was in 1752 elevated to the bench as a judge of the court of session. In 1763 he was made a lord of judiciary. Under the title of Lord Kames he filled both offices with ability and integrity until the close of his life. As an author he is known by numerous works on law, metaphysics, criticism, agriculture, &c., covering a period of more than 50 years, and all evincing a vigorous intellect and remarkable industry. To legal literature he contributed a series of reports, consisting of an abridgment of the "Decisions of the Court of Session" from its foundation, arranged like a dictionary (2 vols. fol., 1741), "Remarkable Decisions of the Court of Session" (2 vols. fol., 1728-'66), covering nearly the whole period between 1716 and 1752, and "Select Decisions of the Court of Session from 1752 to 1768" (1 vol. fol., 1780); "Statute Law of Scotland abridged, with Historical Notes" (8vo. 1757); "Principles of Equity" (fol., 1760), &c. In 1751 appeared his "Essays on the Principles of Morality and Natural Religion" (8vo.), a work of ability, but which gave offence to the Scottish church from the supposed irreligious tendency of some of the author's views. The work however upon which his reputation chiefly rests is his "Elements of

Criticism" (3 vols. 8vo., 1762), which was greatly admired at the time of its appearance, possessing, in the opinion of Dugald Stewart, "infinite merits," but of which Goldsmith once said: "It is easier to write that book than to read it." He also published: "The Gentleman Farmer, being an Attempt to improve Agriculture by submitting it to the Test of Rational Principles" (1772); "Sketches of the History of Man" (2 vols. 4to., 1774); "Loose Hints on Education" (8vo., 1781), written the year before his death. As a member of the board of trustees for the encouragement of the fisheries, arts, and manufactures, and a commissioner for the management of forfeited estates, he labored earnestly to promote the material prosperity of Scotland. In 1807 appeared an account of his life, by Lord Woodhouselee (2 vols. 4to.).

HOMER, JOHN, a Scottish author, born in Leith, Sept. 22, 1722, died in Edinburgh, Sept. 5, 1808. He was educated at the university of Edinburgh, and after a course of theological studies was licensed to preach in April, 1745. He was naturally of an impulsive and chivalric nature, and upon the outbreak of the rebellion in 1745 took up arms on the Hanoverian side. He was taken prisoner at Falkirk in 1746; but having effected his escape, he resumed his professional studies, and in the latter part of the year was presented to the parish of Athelstaneford, made vacant by the death of the Rev. Robert Blair, author of "The Grave." He gave much time to historical reading and dramatic composition, and in 1749 went to London with a tragedy entitled "Agis," which Garrick, then manager of Drury Lane, declined to accept. Although much mortified by his ill success, he set about the composition of another tragedy, "Douglas," founded on the old ballad of "Gil Morrice," which, upon being presented by the author to Garrick in 1755, was likewise refused by him. It was produced at Edinburgh in December of the succeeding year with great success; but so violent a storm was raised by the fact that a minister of the church of Scotland had written a play, that, notwithstanding the national pride was exceedingly flattered by the performance, Home was threatened with deposition, to avoid which he resigned his living in June, 1757. He removed to London in the same year, and had the satisfaction of seeing "Douglas" brought out at Drury Lane with complete success, on which occasion the exultation of his countrymen was carried to a ludicrous excess. By the aid of the sinecure office of conservator of Scots privileges at Campvere, presented to him by the earl of Bute, and of a pension of £300 bestowed upon him by George III., he was enabled to pass the remainder of his long life in comparative affluence. He wrote 4 other tragedies, the "Fatal Discovery," "Alonzo," "Alfred," and "Aquilaia," which, with his early effort "Agis," were originally performed with success, but have long been forgotten. The last 40 years of his life were passed in Scotland. "His own favorite model

of a character," says his biographer Mackenzie, "and that on which his own was formed, was the ideal being Young Norval in his own play of 'Douglas.'" His literary reputation rests entirely upon his "Douglas," which is still highly esteemed, notwithstanding Dr. Johnson said "there were not 10 good lines in the whole play," and still frequently performed, notwithstanding the declaration of Garrick that it was totally unfit for the stage. He also wrote a "History of the Rebellion of 1745" (4to., London, 1802), which is commended by Prof. Smyth. His complete works, with an account of his life and writings, were published by Henry Mackenzie (3 vols. 8vo., Edinburgh, 1822).

HOMER, or CHOMER, among the Hebrews, the largest dry measure, equal to 10 ephahs, or to 19,857.7 Paris cubic inches. It was in later times replaced by the *cor*.

HOMER. The extant biographies of the greatest of the Greek poets preserve little but untrustworthy traditions of his life. In antiquity there were at least 16 works on the life and poems of Homer. Two biographies only remain, one attributed to Herodotus, and one to Plutarch. Both have been pronounced, on the most satisfactory evidence, to be forgeries; but both are ancient, and contain the current legends and traditions relating to the life and adventures of the poet. His mother is said to have been Crithis; and one legend represents him to have been born on the bank of the river Meles, near Smyrna, whence the name Melesigenes; another relates, that Crithis was married to Mæon, king of the Lydians, who brought up her son—the offspring of a daemon or genius—as his own, whence the name Mæonides. Ephorus, according to Plutarch, refers the origin of the name Homer to the poet's blindness, *Ὀμῆρος*, according to him, signifying a blind man. Other explanations, equally fanciful, were invented by the ancients. Another legend states that Homer became a schoolmaster and poet in Smyrna; that he was induced by Mentes, a foreign merchant, to travel; that while visiting Ithaca he was attacked by a disease in the eyes, which resulted in total blindness; that he composed verses, which he recited wherever he went; that Thestorides, a schoolmaster of Phocæa, carried a copy of Homer's poetry to Chios, and recited it as his own; that Homer followed him thither, and resided long at Bolissos, a town in Chios; and finally, that he died on the little island of Ios, when journeying to Athens. A legend repeated by Plutarch is that the poet when on his way to Thebes landed at Ios, and there died of vexation at being unable to solve a riddle propounded to him by some young fishermen, in answer to his question if they had got any thing. "As many as we caught," said they, "we left; as many as we did not catch, we carry." Most of these traditions are evidently fictitious; and, as is well known, the very existence of Homer has been denied. But the want of authentic records of the particulars of his life is no proof that he did not live, when

weighed against the facts: 1, that a remarkable body of poetical composition has come down from remote antiquity under his name; 2, that he is referred to by the Greek writers who stand nearest to his supposed age, in point of time, without the slightest suggestion of a doubt of his existence, and of his being the author of the poems; 3, that the unanimous opinion of antiquity, in all the subsequent periods of ancient literature, is unequivocally in favor of this view; and finally, an analysis of the *Iliad* and *Odyssey* demonstrates the unity of authorship, consequently the individual existence of the author, whether we call him Homer or by some other name; and as no other name has been suggested, either in ancient or in modern times, it would be absurd not to accept the one adopted by the concurrent voices of antiquity. We may assume then the extreme probability that there was, in the earliest period of Greek poetical literature, a great poet named *Homeros*—Homer—whatever may be the meaning of the name. We cannot determine his age with much precision. Herodotus believes him to have lived about 400 years before himself; an opinion which, if true, places him in the second half of the 9th century B. C. But the various dates of his age range from 1184 to 684 B. C.; the last is undoubtedly too recent, and the first probably too early. It is almost certain that he must have lived considerably before the date of the Olympiads, 776 B. C. If we place him between 1000 and 800 B. C., we shall probably come as near the truth as we now can. It seems certain that Homer must have been an Asiatic Greek, first, from the nearly unanimous opinion of the ancients, and second, from the internal evidence of the poems themselves, which are obviously composed from an Asiatic point of view, so far as local allusions, the coloring of nature, the direction of winds, and other physical phenomena are concerned. But the well known fact that 7 cities contended for the honor of being his birthplace shows how little his history was really known. It may be said that, in addition to the uncertain approximation to the period in which he lived, and to the fact that he was an Asiatic Greek of the Ionian race, we only know that he was an *αοιδος* or bard. The perfection of the language, as found in the Homeric poems, implies a long and careful poetical cultivation. There is an early stage in the progress of society when all the influences seem most favorable to poetical composition, at least to poetry of the epic character. It is a period of social refinement, before luxury has corrupted the purity of moral feeling, and broken down the strength of the manly character; and it generally follows a time of great struggles in the formation or the preservation of the state. It is when language has lost the meagreness of its early growth, and ceasing to be rude is still marked by its primitive and picturesque significance, and before the speculations of philosophy, scientific abstractions, and multiplying social relations have imparted to words numerous secondary

meanings, more or less confusing or effacing the images they at first presented. The Ionic dialect, moulded under the happy influences of a serene and beautiful heaven, amid the most varied and lovely scenery in nature, by a people of manly vigor and exquisite mental and physical organization, of the keenest susceptibility to the beauty of sound as well as form, of the most vivid and creative imagination, combined with a childlike impulsiveness and simplicity, had attained, when Homer appeared, a descriptive force and harmony which made it the most admirable instrument on which poet ever played. For every mood of mind, every shade of passion, every affection of the heart, every form, sound, and aspect of the outward world, it had its clear, appropriate, and rich expression. Its words and sentences seem to place the things described before the eye of the reader. In structure, it obeys the impulse of thought and feeling, rather than the formal principles of grammar. It expresses the passions of robust manhood with artless truth. In its freedom, its voluble minuteness of delineation, its rapid changes of construction, its breaks, pauses, significant and sudden transitions and irregularities, it exhibits the intellectual play of natural youth; while in boldness, splendor, and majestic sweep, it bears the impress of genius in the full strength of its maturity. On the mainland of Greece, the earliest poetical compositions were oracular and religious; the next undoubtedly were the songs of the bards, celebrating the warlike deeds of leaders and kings. In passing over to the islands of the *Ægæan* and the coast of Asia Minor, they carried with them this body of legendary lore. In this way groups of heroic characters, founded on tradition, but embellished by the imagination of the successive generations of singers, were formed. In the colonial societies of Asia Minor, the traditions of former times, embodied in the ballad poetry of Greece, were fondly cherished; and in the rapid progress of national prosperity, which appears to have crowned the early youth of the Greek life in Asia, these national minstrelsy served to delight the multitudes, when delivered by the singers or rhapsodists, in the popular and religious festivals, or in the halls of princes. The singers found in the ballads thus composed, and perhaps orally transmitted, the richest mines of legendary poetry; and in process of time pieces of greater length, with more fully developed characters, and varied dramatic action, were required by the advancing culture of the race. The Greek epic was a species of story-telling, for the entertainment of assemblies. It was delivered in a kind of musical recitative, with a slight accompaniment of the *phorminx*, or four-stringed lyre. In Ionia the ballad minstrelsy flourished with the greatest luxuriance, and finally was developed by the genius of Homer into the full form of the epic. Antiquity paid divine honors to the name of the poet. From his poems the ablest critics inferred the laws and cited the highest examples of epic composition.

The chief cities of Greece had their copies prepared under the inspection and stamped with the authority of the state. The greatest poets of succeeding times were proud to confess that they drank from the inexhaustible fountain of Homer. The great festivals of Athens were graced by the public delivery, with suitable pomp of accompaniment, of those great epics. If we trace the outlines of Homer's intellectual culture, by following out the hints scattered through the *Iliad* and *Odyssey*, we must reject the legend that the poet was a blind beggar bard, and picture him to ourselves in a very different light. He was evidently placed in a condition of life which surrounded his childhood with the most favoring influences. He must have received from nature an exquisite physical organization; no object, great or small, within the range of vision, escaped the glance of his vigilant eye; his ear was attuned to a delicate perception of the melodies of nature and art; his sensitive nerves vibrated to every breath of heaven and every impulse of the soul; and his busy fancy was for ever moulding and recombining what he had seen, heard, and felt. We have the most striking proofs that he had visited every important city of Asia Minor, and all the *Ægean* islands; that he had carefully inspected the plain of Troy, and the shores of the Hellespont; that he had crossed the sea to Africa, and ascended the Nile; that he was familiar with the coasts, rivers, mountains, and cities of Greece; that he had visited all the islands along the western shore as far north as *Corcyra*; that he had probably seen a part of Italy, and had passed the straits that separate it from Sicily. He was equally at home in the movements of war and the arts of peace. At sea, he knew every rope in the ship, and exhausted the nautical lore of the sailors. He probably listened to the stories of the navigators with whom he sailed over the *Ægean*, and out of these materials at a later period wove the web of his own enchanting tales. We may imagine that during his wanderings, his thoughts "voluntary moved harmonious numbers," and that the inspiration of the muse stole upon him, under the walls of Thebes, in the shadow of the pyramids, on the bosom of the roaring sea, on the storm-lashed shore, under the blaze of day, in crowds of men, in the deep silence of the night, at the rising of the sun, at the setting of the Pleiades. We must suppose that his genius had long trained itself, instinctively if not consciously, for his great poetical task; that he had listened with delight to the songs of the bards, reciting the achievements of another age; that he had joined reverently in the processions, and heard the prayers of the priests as they invoked the blessings of his country's gods. We may believe that he had tried the powers of his native *Ionian* tongue, and sought the ample phrase and resounding line that should fittingly express his crowding and fiery thoughts, and that he felt while he listened to the minstrels of his age

that they had not touched the deepest chord. And when he comes forward himself to try his hand upon the phorminx, in the bloom of his early youth, the sweet modesty of his expression, and the inborn nobleness of his manner, excite interest and command attention. Of what shall he sing, but the wrath of Achilles—the ever youthful hero of the Trojan tale? The hearers become suddenly conscious that no common hand is upon the lyre, and a deep stillness pervades the assembly, broken only by the rich and powerful voice of the new *aoidos*, as he invokes the muse, *Μῆνιν αἰείδω, Ζεῦ*. The story of the chieftains' quarrel is soon told; the rhapsody ends too soon; and after a moment of expectant silence, long and loud applauses from that spell-bound throng rend the skies. From this moment all who are present know that the great creative intellect, the wisest man of his age, has appeared among them. Soon there will be no doubt in *Ionia*, or in Greece, who is the great poet—the favorite of men and gods. Such we conceive to have been the commencement of Homer's poetical career, and the first step toward the conception of the plan of the *Iliad*. It seems most probable that Homer did not pass at once from the ballad composition, the only narrative before him; but that the story of Troy, and the poetical eminence of the wrath of Achilles among its incidents, gradually broke upon him; that the creation of the *Iliad* was the organic growth of studious years, passed in the practice of the minstrel's art; and that, after this long study, it reached its natural termination, received its completed form, and its unity of spirit. In the continuous practice of the poetic art, he had combined the epic elements of the heroic traditions, had breathed fresh life into the traditional characters, and had brought the several parts of the *Ilian* story into such intimate connection and harmony, that they no longer appeared as ballad minstrelsiels, serving the poet's turn for brief rehearsals, but embodied in one magnificent panorama all the essential features of the great national adventure. The time occupied by the direct action of the *Iliad* embraces only between 40 and 50 days; but what preceded and followed in the national traditions is implied or incidentally introduced. The plan is highly ingenious, and could not have been accidental—that is, could not have arisen without the arrangement and conscious purpose of the artist; and it is a plan which possesses in a remarkable degree the essential requisite of unity in variety, springing from the ordaining action of high creative genius. The plan of the *Odyssey* is more complicated than that of the *Iliad*, and the materials present a richer variety. Homer had already conceived and executed the plan of a great epic that embraced the most striking parts of the Trojan war; and the legends of the returns of the heroes naturally offered themselves to him as the materials of a new poem of similar extent. Among these, the adventures of the wise *Odysseus*, and his long wanderings before he retrod the soil of his

native Ithaca, were probably favorite themes of the singers. His bravery, his ready counsel, his eloquence in debate, described in the Iliad as resembling the snow flakes falling in winter, his prompt device in meeting every emergency, made his character and fortunes a subject on which the imagination of the subtle Greek always delighted to dwell. The return of Odysseus therefore naturally attracted the attention of the poet, and formed the centre around which the second great epic action revolved. The poet had passed the fiery years of youth; he had exhausted the poetical resources of martial achievements, and now the calmer aspects of life rose before him with more attractive charm. The Odyssey reversed the picture of the Iliad. Hence, the quiet scenes of common life, the incidents of the voyage and the land journey, here stand in the foreground. Looking at the Odyssey as a work of art, we find in it more of premeditation, in its general scheme, than in the Iliad. The difference is recognizable in the very first line. The Iliad opens with a call upon the muse to "sing" the wrath of Achilles, and the Odyssey invites her to "tell" or "relate" the adventures of Odysseus; as if, when he began the composition of the Iliad, he had only a song in his mind, the great plan coming afterward; and when he began the Odyssey, he had preconceived the whole epic narrative. There are several distinct lines of adventure, all leading to the same point, the proper adjustment and right management of which required not only careful previous reflection, but constant exercise of skilful arrangement and organization, that each, while clearly and carefully executed, should yet be kept in due subordination to the general design of the whole. In point of poetical merit—richness of invention, brilliancy of imagination, and fitness of expression—it cannot be said that the Odyssey is at all inferior to the Iliad. The subjects are different, and require to some extent a difference of handling; there is, therefore, an appearance of more vigor in the one, of calmer beauty in the other. But in the Iliad there are scenes of domestic life and affections breathing the greatest tenderness and beauty, and in the Odyssey passages of grandeur and sublimity unsurpassed in the Iliad; showing that in the warlike and fiery Iliad the poet had the same sense of the beautiful as in the Odyssey, and in the Odyssey the same wonderful vigor as in the Iliad. Though we may admit, with Longinus in his fine criticism, that the Iliad was the work of the poet's youth, and the Odyssey that of his declining age; that the former was the sun in his midday splendor, and the latter the sun in the beauty of his setting; still, in both it is the sun that shines, and the glory is not less in one than in the other.—Among the ancients, a question was started by some of the later Greek critics whether the Iliad and Odyssey were the work of the same author; but it was only a question; or rather the theory of a different origin was held only by a few; the overpow-

ing weight of the best opinion was in favor of the unity of authorship. Aristotle held that the "Hymns," now generally published with the Iliad and Odyssey, were not his composition, and the best modern critics coincide in this judgment. But no doubt ever suggested itself to the masterly critic of the Lyceum, that the great epics were from the hand of Homer. In modern times a theory has been constructed of the origin and character of the Homeric poems, according to which they are not epics at all, but only disconnected compositions, by many ballad-makers, happening to be so composed, and on such subjects, that they were capable of being strung together, and that they have been gradually moulded into their present form; the theory asserts further, that alphabetic writing was either not known at all in Greece and Ionia in that age, or if known the materials were so scarce, cumbersome, and costly, that the art was unavailable for literary purposes; that there was no such man as Homer, but the name is simply an etymology. All these views have not been held by all who have rejected the unity of the Homeric compositions; but the above statement embraces summarily all the main points in the discussion of the Homeric question. The outlines of it were suggested by Vico in his *Scienza nuova*. Casaubon expressed doubts upon the subject. Bentley took substantially the view that Homer composed only short pieces, to be sung, one at a time, for the amusement of festive companies. Perrault and Hédoulin, two French critics, also sketched the outlines of the theory that no one poet was the author of the Iliad or Odyssey, but that both poems were compilations of minstrelies composed by many different persons of the same or nearly the same age. This particular view was adopted and maintained by Heyne, with great learning. The theory of F. A. Wolf starts from the same point as Bentley's, and is developed in his *Prolegomena* (1795) with masterly ability and eloquence. Wood, a learned Englishman, who had travelled in Greece and the East, and published in 1770 a little book on the "Original Genius of Homer," held the opinion that the poems were not originally reduced to writing. This view was entertained by Frederic Jacobs, as will be seen from the following picturesque passage in one of his discourses. Led away by the genius of Wolf, he says: "Writing conquers speaking, and strikes it dead. The lyre is silenced, and lives only as a figure of speech in written odes; song dies in the musical sign, and the written precept soars proud and cold away over the surrounding scene, to a remote and wide-extended world, and often beyond the present, directly to coming generations. Almost 5 centuries had gone before the poems of Homer were imprisoned in written characters; and even then, mindful of their original destination, they flowed more sweetly from the tongue to the ear." Wolf's theory was, for a time, generally adopted, and his ingenious arguments were accepted as de-

monstration. Since his day the question has undergone many searching scrutinies; among his own countrymen, Nitsch has answered Wolf very ably; but by far the most thorough, learned, and conclusive demonstration of the entire fallacy of the theory, in every form it has assumed, is that of Col. Mure, in his still unfinished "History of Greek Literature." A few remarks on several of the leading topics are all that are necessary to complete our own view. 1. No person, reading these two poems without prejudice, and exercising merely common sense, would ever suspect a want of unity, completeness, or coherence, except in some very unimportant particulars. 2. Slight contradictions, inequalities, and incoherences, at least to an equal extent, may be found in the best authors, as in Virgil, Cervantes, Milton, Scott, and many others; and the argument drawn from such premises, in the case of the Homeric poems, proves nothing or too much. The critical dogma, as laid down by Hermann, "that no two passages in the same work, contradictory to or irreconcilable with each other, can be by one and the same author," in its unqualified form, has no foundation in human nature, and is not supported by literary experience. 3. The argument drawn from the supposed want of writing materials, and possibly the ignorance of the art of writing in the age of Homer, is founded on a mere assumption, with no facts and no opinions of the ancients to support it. On the other hand, the employment of writing by Homer is silently taken for granted by those who lived nearest his age, the poets of the 7th and 8th centuries B. C., who certainly employed writing themselves, and who never allude to it as a newly discovered art. We cannot argue, from the present non-existence of written documents of the age of Homer, that they never existed. Moreover, there are absolute proofs that the art of writing, and abundant and convenient materials for writing, such as reed pens, papyrus, and ink, were in common use in Egypt more than 1,500 years before the birth of Homer. It is supposed that the Phœnicians formed their alphabet by selecting some of the phonetic elements from the Egyptian hieroglyphics, and that, long before Homer, they had carried with them the art in their voyages round the Mediterranean. The Greeks of Ionia were in frequent intercourse with both Egyptians and Phœnicians, and it is incredible that so intellectual a race should have neglected to avail themselves of an art so convenient for every purpose of business or literature, which had long been possessed by nations intellectually inferior to themselves. We must say that all the facts and probabilities that have any bearing upon the question, are against the theory of Wolf. A more recent German critic, Lachmann, carries the separating process so far as to distribute the Iliad among about 18 poets. Mr. Grote, in his "History of Greece," argues that originally there was an Achilleid, i. e., an epic on the exploits of Achilles, and that the other portions of

the Iliad were not included in the original plan. In the first place, it is improbable that several poets, of the highest order of genius, should have appeared in Ionia in the same age, though perhaps not impossible; but the improbability that 18, or more, such poets should have appeared, amounts to a moral impossibility; and no one has questioned the general excellence of the whole mass of poetry constituting the Iliad and Odyssey. The internal evidence, not from mere style, for experience shows how deceptive that is, but from the unity of spirit and characters that prevails through both poems, is of the greatest weight; first, in the broadest sense of the term, when we look at the poems as a whole; and second, if we examine the details, especially the characters of the heroes who carry forward the action in the Iliad and Odyssey. The first species of unity of spirit is less conclusive than the second; for there is in every age a pervading tone that marks its literary productions. But no such explanation can make it probable that complete identity would be maintained in the characters, through a large number of literary works, by different authors. We must believe, it is true, that the subject of the Trojan war had already been handled, in the age immediately following that event, and in the hexameter verse. We may suppose, too, that the names and exploits of many of the heroes had already been made familiar in the ballad literature of Greece; like the legendary Cid in the ballads of Spain, like Arthur and the knights of the round table, like Charlemagne and his peers, and like Hagen, Guntler, and Siegfried in the mediæval poetry of Germany. But the ballad, even the *Nibelungenlied*, is only a rudimentary epic, and does not allow of the development of character with minute and careful study of the nicer shades. To work them out with finished detail belongs to trained poetic art, guided by principles which have been ascertained by study and experience. And this is the way in which Homer used the materials furnished by his predecessors; it is the way in which Shakespeare used traditions and characters, the outlines of which had been drawn by the feebler hands of the poets who had gone before him. That one author should have composed the Iliad and Odyssey is not without example; but he must have possessed gifts of knowledge and genius in as large a measure as was ever bestowed upon man. That many poets should not only have possessed an equal measure of these endowments, but that they should have worked in the same spirit, conceived not only the leading characters, but a vast number of subordinate ones, in the same way, marked their appearance, their actions, their speech, by precisely the same traits, so that each and all should on each and every occasion conduct themselves consistently, express themselves according to their special characteristics—so that they should have given not only to the modern reader, but, so far as we know, to those who lived nearest the times

of the composition of the poems, an abiding and all but universal impression of the unity of their origin—that these extraordinary results and unparalleled coincidences should have been accomplished by a troop or succession of poets, requires a marvellous amount of credulity on the part of the critics who refuse to believe in the existence of Homer and in the unity of his works. The fidelity of the author of the *Iliad* and *Odyssey* to nature; the minute and accurate observation of the peculiarities of each region through which the action and the narrative move; the descriptive epithets applied to hills, rivers, plains, mountains, seas, and islands; the exact descriptions of storms and currents in the Mediterranean and the character of the coast; the correct perspective, so to speak, of each scene, argue strongly in favor of the single undivided authorship of these immortal poems.

—The Homeric poetry was the bright consummate flower of Ionian genius. The mind of its author grasped all the knowledge of his age, and embraced the whole extent of human life in its heights and depths. He measured the strength of manly passion, and sounded the abysses of the human heart. Over all the varied and contrasted scenes which his genius touched, he poured the illumination of a bright and genial spirit, which must for ever draw to the heroic age of youthful Greece the generous heart of kindred youth wherever the love of song and the passion for literary culture have found a home. The peculiarity in the position of the *Iliad* and *Odyssey* is, that they hold their place as the last product in the growth of a popular and national minstrelsy, and embody in the richest rhythmical forms the heroic life of the ancestors of the poet's own contemporaries; and they stand, in subject, substance, and spirit, in the closest relation with the lyric and dramatic poetry and the plastic art of the Greeks in the subsequent ages.

—The best editions of Homer are: Barnes (2 vols. 4to., Cambridge, 1711); Ernesti's *Clarke* (5 vols. 8vo., Leipsic, 1759–64), and the Glasgow reprint (1814 and 1824); Wolf, *Homeri et Homeridarum Opera* (Halle, 1794, and 1804–7), with the *Prolegomena*; Heyne's great edition of the *Iliad* (8 vols. 8vo., Leipsic and London, 1802); Spitzner's *Iliad* (Gotha, 1832–6); Bekker's (text, Berlin, 1843). Very useful editions are: F. H. Bothe, *Homeri Carmina* (2 vols. 8vo., Leipsic, 1834), with a Latin commentary; G. C. Crusius, *Homeri Ilias* (1 vol. 8vo., Hanover, 1837), and *Homeri Odyssea* (1 vol. 8vo., Hanover, 1837), both with German notes; G. Bärmlin, *Homeri Opera* (2 vols. 8vo., Leipsic, 1854), with an able *Commentatio de Homero ejusque Carminibus* prefixed. The editions by Prof. J. J. Owen of New York are excellently adapted to the use of schools. Of illustrative works the most important are the commentaries of Nitsch on the *Odyssey* (Hanover, 1825); Buttmann's *Lexilogus*, translated by Fishlake (London, 2d ed., 1840); "Introduction to the Study of the Greek Classic Poets," by Henry Nelson

Coleridge, reprinted from the English edition (12mo., Boston, 1842); "Lexicon of the Poems of Homer and the Homeridae," translated from the German of G. C. Crusius, by Henry Smith (Hartford, 1844; a most useful work); Mure's "History of Greek Literature;" and above all, the "Studies on Homer and the Homeric Age," by the Right Hon. W. E. Gladstone (3 vols. 8vo., Oxford, 1858). The English translations are those of Chapman, Pope, Cowper, and Sotheby. Portions have been admirably rendered by Dr. Maginn, in ballad measures. The best translation of the entire *Iliad* is by the late William Munford, of Richmond, Va. (2 vols. 8vo., Boston, 1846). Two books of the *Iliad*, the 1st and 24th, have been translated in English hexameters, in "Blackwood's Magazine;" and the first 6 books, in the same metre, by Mr. Shadwell.

HOMESTEAD, the place where one's dwelling is. We mean by this the home itself, with the outbuildings connected with it, and a portion of the land, as the garden, and it may be some fields, &c. It is obvious, however, that if one owns a large tract of land, and lives upon a corner of it, he cannot claim that the whole is a homestead in law; and yet there are no sufficient rules nor precedents for determining how much of this land is thus attached to the dwelling. It has been in fact said by the courts that there is no positive rule; and that the exact meaning of the word must be determined in each case by gathering from the context of the instrument in which it is used, and from the circumstances of the case, its intended extent and operation. It is to be the more regretted that we have no exact definition of the word, because by the recent laws of many of our states it has become of much importance. They make the homestead secure against attaching creditors, and in most cases offer no other definition of it than by mere value. Thus the law exempts from attachment, or surrender in insolvency, a homestead, not exceeding in value \$500, in New Hampshire, Vermont, Maine, Massachusetts, and Ohio; 40 acres, not exceeding that sum in value, in Alabama; \$1,000 in New York, New Jersey, and Illinois; 200 acres, or \$1,000 if in a city, in Texas; and \$5,000 in California. On what part of the land, or by whose selection, or on what principle, this quantity in value shall be discriminated, does not seem to be determined by statute provision.

HOMICIDE, in criminal law, the killing of one human being by another. By the common law, it is not homicide to kill an infant before its birth, the authorities declaring that if one purposely kills a babe not yet born, it is only a misdemeanor and not a felony; but if the child is born alive and then dies from the previous injury, it is felony. And every part must be born alive, but the umbilical cord need not be parted; nor need the child have breathed, if it otherwise had life. So, if one intending to procure abortion does an act which causes a child to be born prematurely, and being so born,

it dies because not mature enough to live, this is murder. But where a woman cut off the head of her child before it was wholly born, it was held not to be murder. The crime of child murder and wilful abortion is made punishable in many of our states by statute. Homicide is divided into 3 classes, justifiable, excusable, and felonious. Felonious homicide is either manslaughter or murder, which will be treated under those titles. In this article we shall speak only of homicide which is justifiable, and that which is excusable. These two are often confounded, and are sometimes spoken of as if they were the same thing, even in technical books of criminal law. But this is an inaccuracy. Justifiable homicide is that which is just and right, and not to be regretted; while excusable homicide is that for which excuses may be offered which take away wilful guilt from the killer, however much the act may be lamented. In this strict sense, there is perhaps no justifiable homicide except that which is committed officially and in the discharge of a legal duty. That is, there is no homicide strictly justifiable except the homicide by an executioner, or that of a public enemy in open war. If one, at great risk to himself, and in defence of the innocent, encounters and destroys an assassin, who could not otherwise be prevented from putting many to death and inflicting injuries worse than death, he may deserve and receive general applause. And the excuse extends much beyond those crimes which are punishable with death; because a man would be excused for putting an offender to death if that were the only way of preventing certain crimes, which if committed might not be punished with death, such as rape, burglary with arms, or robbery with arms. Again, the excuse in this case, as in that of self-defence, does not depend altogether upon the actual facts of the case, but much, and perhaps principally, upon the appearance of it to the person committing the homicide; for if, as a reasonable man, he was fully justified in believing that the peril from which he could deliver himself only by homicide was actual and imminent, the excuse is not taken away by proof that he was deceived. Thus, if one were attacked by an assailant threatening to shoot him with a pistol, and would be justified under the circumstances in killing his assailant if the pistol were loaded and the assailant intended to use it, and the assailed party had reason to believe this to be the case, his excuse would not be lessened by proof that the pistol was not loaded and his death not intended. The excuses for homicide sometimes mingle; thus one who is attacked by a murderer and cannot otherwise escape, may put him to death, either to prevent this felony, or to save his own life. But one who would escape the consequences of homicide by the excuse of self-defence, must be able to show that there was some overt act on the part of the assailant, and that the assailed was not moved by threats only, or merely by fears of what would be done, however just and rational

they might be; but waited until some act took place to protect himself, not merely from fatal violence, but from grievous bodily injury. What this means is not plainly defined by the law; but it does not mean the injury caused by a blow from a fist or a stick, or a slight wound, which might be painful for a time, but from all effects of which the injured person would certainly and entirely recover within a few days. And here, too, as before, death must not be inflicted until nothing but this remains. That is, the party assailed must retreat as long and as far as he can retreat; must seek and use any refuge or means of escape open to him; and only when these are exhausted, or non-existent, can he put his assailant to death. It should however be stated, as a settled rule of law, that an assailed party, in danger of death or grievous harm, is bound to retreat only when he can do this with safety. For if retreat will only increase a danger already imminent, and give his assailant new power over him, he need not retreat at all, but may at once inflict death upon his assailant. So, too, homicide is excusable if inflicted as the only means of preventing a great crime. Here the law comes in with what may seem to be a definition; for it says that one may inflict death if there be no other way to prevent a felony. But the reader will see, under the word FELONY, that its meaning is quite undetermined; and there are things which are still called felonies, at least in England, of which we should be unwilling to say that they might lawfully be prevented by putting the offender to death. And yet it must be certain that the law would call this only excusable homicide, and not justifiable. Excusable homicide is then that which is caused by self-defence, or the prevention of great crime, or accident. It is excusable by reason of self-defence, if it were strictly necessary for this purpose, and not otherwise. We believe that there is no rule of criminal law which ought to be more certain, and more universally acknowledged, than that homicide in self-defence must be grounded upon a strict and absolute necessity. It cannot be doubted that any one may save his own life by taking the life of his assailant; but it is equally certain, as matter of law, that he must not secure his safety by homicide, provided he could secure it in any other way, as by retreating, or seeking refuge, or inflicting a less than fatal injury. We suppose that any difficulty which belongs to this subject must attend upon the application of these principles, and not upon the principles themselves. Thus, it is certain that the laws of England and of the United States agree in an absolute refusal to recognize the point of honor in cases of homicide. Juries, and possibly courts, may be influenced by it, perhaps unconsciously; but the law ignores it. If one attacks another with every form and method of insult, and the attacked party, finding no other way of stopping the insult or escaping from it, puts the assailant to death, it is felonious and not excusable homicide. So, also,

the assailed party may take his assailant's life, if he cannot otherwise prevent an act of decided hostility, which might reasonably be regarded as the beginning of a course of conduct which would end in his destruction. In reference to the excuse of accident also, it may be mingled with another. Thus, while one has no right to protect himself from slight bodily injury by putting his assailant to death, or to use that means of preventing wrongful conduct not of the gravest sort, yet he has a right to defend himself against any assault, and to protect himself from any injury, and to prevent any wrong doing. And if in all this he uses no weapons likely to produce death, and does not manifest by violence and excess a fatal purpose, he would be excused although the death of the wrong doer was the unintended result. Thus, one may turn a mere intruder out of his house, although he is quiet there, and, if necessary, put him out by force; but must not put him to death because he will not go out. But if, while using only such force as may seem necessary, he kills the intruder, he would be excused. In reference to this right of self-protection, the question has been raised whether the use of spring guns is lawful. It seems to be the law, that one may use a spring gun to prevent felony, and that homicide caused by it would be excusable; but that it is not lawful to use such instruments merely for the protection of property, and if they caused the death of a trespasser the homicide would not be excusable.

HOMŒOPATHY (Gr. *ὁμοιος*, like, and *παθος*, suffering), the title of the system of medical practice introduced a little more than 50 years ago by Hahnemann. (See HAHNEMANN, SAMUEL.) The distinguishing characteristic of this method consists in its employment of medicaments agreeably to the principle denoted by its name, viz., "like cures like," and its recognition of this precept as the sole law of cure; or, to state it in other words, in its choice for the sick of such drugs as have produced in the healthy subject the symptoms present in the malady under treatment. It is contended by the advocates of this system that glimpses of the truth of the law, *similia similibus curantur*, had already occurred in the earlier history of medicine. Even Hippocrates mentions it; and though, in later times, Paracelsus, Stahl, Haller, and others hinted also at its importance, yet Hahnemann was the first to assert its value and to institute the labors required in its practical adaptation to the cure of disease. In 1790, while engaged in translating Cullen's "Materia Medica," the prevailing theories of the *modus operandi* of Peruvian bark, in the cure of intermittent fevers, arrested his attention and led him to experiment with this remedial agent upon his own person. The trial resulted in the production of a species of ague resembling that form for which bark had proved most uniformly specific. To his mind this was the revelation of a principle. It was, indeed, the key to the generalization of the action of drugs which stamps

his system of medicine. Stimulated by his new idea, he tried other remedies upon himself, noted carefully their effects, and began to treat diseases accordingly. The success of this crucial experiment gave birth to homœopathy. Two supplementary doctrines in homœopathy, which also owe their origin to Hahnemann, deserve especial notice; these are his theory of chronic diseases, and his views as to doses. Much practical experience had convinced Hahnemann that, though the resources of his new method were adequate to the prosperous cure of acute diseases, yet in chronic affections their action seemed often anomalous, or restricted to mere temporary palliation. Analogy led him at last to conclude that all chronic diseases, i. e., such as are ultimately incurable by nature's spontaneous effort, depend on some miasmatic basis or origin. He assigns them to three sources, viz., syphilis, sycoosis (venereal wart), and itch (*psora*). Through the injudicious suppression of these dyscrasie by external remedies arise, he affirms, all the protean forms of chronic evils; and in his work on "Chronic Diseases" (1828-'30) are enumerated over 100 current maladies derived from the secondary development of the last named of these contagions alone. The bulk of the work just mentioned is devoted to the enlargement of the resources of the pure materia medica, in the display of pathogeneses or symptoms of remedies found more or less specific against these constitutional taints. But the most startling of Hahnemann's tenets is unquestionably his scheme of doses. Up to about the year 1815 the size of the dose he habitually used, though far less than that previously employed by physicians, was still not in striking contrast with received ideas. The subsequent change in his views on this subject is announced in the following note appended to a record of a case illustrating some instructions in the method of prescribing homœopathically, and in which the dose administered was a whole drop of the juice of bryony root: "The latest improvements in our art demonstrate that the administration of a single, smallest-sized pellet (a sugar globule, size of a mustard or poppy seed), moistened with the decillionth attenuation ($\frac{1}{10^9}$) of the drug, would have been fully adequate to perform this cure; nay, it is equally certain that even smelling of it would have sufficed; so that the dose employed in the foregoing case is no longer to be commended to imitation." The manner of preparing the dilution here referred to is as follows: one drop of the juice of bryony root is put to 99 drops of pure alcohol, forming the first dilution, each drop of which contains, of course, $\frac{1}{100}$ of a drop of the active element; of this solution one drop is taken and added to 99 drops of fresh alcohol, to make the 2d dilution, $\frac{1}{10,000}$; in a similar way the 3d, 4th, &c., successively, up to the 30th dilution, are produced; the last of these containing, as is evident, in each drop, one decillionth of a drop of bryony juice. All liquid or soluble substances are submitted to the same

process; insoluble bodies, as metals, earths, &c., after being previously brought to sufficient fineness, are reduced through three steps of this series, by thorough levigation with sugar of milk, and their subsequent dilution is then carried on as directed for liquids, it having been ascertained that three successive triturations, if well performed, make them sufficiently soluble to render further mechanical division unnecessary. Other dilutions, however, than the 30th are also employed by the Hahnemannian branch of the school, the 18th, 15th, 12th, 9th, and 6th being perhaps the favorites, although again there are not wanting practitioners who cite marvellous results from the 100th, 200th, 600th, and even the 1500th dilution of certain substances. Incredible as their statements may appear, experience is said nevertheless to prove that exquisitely minute doses are sometimes powerful, and that, too, under circumstances when no faith either on the part of the patient or the doctor can be honestly adduced in explanation of their virtue. Hahnemann offers the rationale that diseased organs become preternaturally sensitive to specific stimuli, just as the eye when inflamed may be intolerant of the smallest ray of light.—A development in science so novel as homœopathy could not long remain unnoticed. Not only was it attacked, but its author soon found sympathy and coöperation in such colleagues as Hartlaub, Stapf, Hartmann, Gross, Rückert, Müller, Griesselich, Schweikert, Hering, Trinks, Schubert, Caspari, Rau, Bönninghausen, and Jahr; converts whose names are linked to his, and who not only diligently applied to practice their newly acquired art, but improved its *matériel* by new provings of remedies, and its status by scientific dissertations and open appeals in its behalf. The establishment in 1822 of the *Archiv für die homöopathische Heilkunst*, a periodical mainly under the control of Dr. Stapf, was an epoch for homœopathy. Science and rank were becoming not unmindful of its existence; and accessions to its lists increased, until to be its proselyte neither involved notoriety nor implied sacrifice. It was, at last, a fact in the history of medicine. It is, of course, difficult to furnish exact statistics of a topic like the present, liable to daily, nay, almost hourly practical changes. According to the best information, there are now not far from 1200 practising homœopaths in Europe alone, nearly two thirds of whom belong to Germany, France, and Great Britain. Numerous dispensaries, hospitals, or wards appropriated to this method of treatment exist in Vienna, Paris, Berlin, Madrid, Turin, Copenhagen, Moscow, St. Petersburg, and other cities. Germany numbers 6 homœopathic journals; England, 5; France, 3; Spain, one; Italy, 2; Denmark, one; and homœopathic societies are found in nearly every large town in Europe. The condition of homœopathy in the United States is not less favorable. It was introduced in 1825 by Dr. Hans B. Gram, a native of Boston, who was educated as a physician in Copen-

hagen, whence, having for some years practised there his profession, he returned and settled in New York. Hering, Gray, Channing, and others succeeded him, and the "Homœopathic Examiner," edited by Dr. Hull, shortly transferred the subject from mere professional to public investigation. American homœopathy now counts 2,500 physicians, 3 colleges, 3 hospitals, 3 journals, several dispensaries, and 20 societies. Of late the homœopathic school has become divided into the sects of "pure Hahnemannians," "rational homœopaths," and "liberal homœopaths." The first follow all the teachings of their founder implicitly, and as a general rule confine themselves to infinitesimal doses, or high dilutions, condemning every departure from this mode of practice as pernicious. The rationalists, while adhering tenaciously to the law of "like cures like," reject some of Hahnemann's subsidiary doctrines, and occasionally resort to allopathic practice. The so called liberal homœopaths have adopted the law that remedies cure by reason of their difference, small though it be, exerting an alterative action, and not by virtue of their mere similarity; arguing that if the greatest amount of similarity were the great point, identity should be infallible. They express this by the formula *alterantia alterantiis curantur*; conceiving it to embrace both the law *similia similibus*, and *contraria contrariis curantur*. The law forbidding the homœopathic physicians to prepare their medicines was abolished in Russia in 1843. For those physicians who prefer to purchase them, special homœopathic drug stores have been established in the principal towns of the United States, and other countries. Recently the homœopathic system has also been successfully applied to the cure of diseased animals.—See Hahnemann, "Organon of Homœopathic Medicine" (4th Am. ed., New York, 1860); Hartmann, "Acute and Chronic Diseases" translated by C. J. Hempel (4 vols., New York, 1847); Hempel, "Organon of Specific Homœopathy" (Philadelphia, 1854); Peters, "Science and Art, or the Principles and Practice of Medicine" (New York, 1860); and the British and American homœopathic journals.

HOMŒOUSIANS (Gr. *ὁμοιοι*, the same, and *οὐσία*, being), in ecclesiastical history, a term which was originated in the 4th century to distinguish the Athanasian or orthodox party from the Arians and Semi-Arians, who were termed Homoiousians (Gr. *ὁμοιος*, similar, and *οὐσία*, being). The former maintained that the Son was of the same essence as the Father; the latter that the Son was similar to the Father in essence, but not identical with Him.

HOMS, **HUMS**, or **HEMS** (anc. *Emesa* or *Emisa*), a fortified city of Syria, 90 m. N. from Damascus, about 1 m. from the river Aasy or Orontes; lat. 24° 17' N., long. 37° 34' E.; pop. about 20,000, including 7,000 Greek Christians. It is a prosperous town, having considerable trade, and manufactories of woollen, cotton, and silk fabrics, and of gold and silver thread. The houses are

built of black basalt, and many of the streets are paved with the same material. In pagan times Emesa was celebrated for its magnificent temple of the sun, one of whose priests, Elagabalus, was made emperor of Rome in the 3d century by the legions of Syria. Odenathus, husband of Zenobia, the renowned queen of Palmyra, was murdered in this city in 266, and Zenobia herself was vanquished in its vicinity, in 273, by the emperor Aurelian. The philosopher Longinus was a native of Emesa, and was on a visit there when Zenobia met him and appointed him her instructor in the Greek language and literature.

HONDURAS (Sp. "depths," probably in allusion to the broken character of the surface), a republic of Central America, formerly a province of the kingdom of Guatemala, bounded N. and E. by the bay of Honduras and the Caribbean sea, S. by the republic of Nicaragua, from which it is separated for the greater part of its length by the river Wanks or Segovia, S. W. by the republic of San Salvador, and N. W. by Guatemala. The republic lies wholly between lat. 13° 10' and 16° N., and long. 83° 11' and 89° 30' W. Its area is about 42,000 sq. m. The political divisions of Honduras are 7, viz.: the departments of Comayagua, Tegucigalpa, Choluteca, Santa Barbara, Gracias, Yoro, and Olancha. The subjoined table gives the capital, area, and population of each, as also the aggregate area and population of the state, as deduced from the best and latest authorities and observations:

Departments.	Capitals.	Area in sq. m.	Popula- tion.
Comayagua	Comayagua...	4,800	70,000
Tegucigalpa	Tegucigalpa ..	1,500	61,000
Choluteca	Nacaome	2,000	50,000
Santa Barbara	Santa Barbara ..	3,250	50,000
Gracias	Gracias	4,050	55,000
Yoro	Yoro	15,100	20,000
Olancha	Juticalpa	11,300	45,000
Total		42,000	350,000

Capital, Comayagua.—The ports of Honduras, on the Atlantic side, are Truxillo, Omoa, and Port Cortes, formerly Caballos. The last was once the most important, but was abandoned during the epoch of the buccaneers for the smaller one of Omoa, 6 m. to the W. On the Pacific, in the bay of Fonseca, the republic has two ports, San Lorenzo, and the free port of Amapala, on the island of Tigre, which has a fine anchorage and salubrious climate. The bay of Fonseca, sometimes called Golfo de Amapala or Conchagua, is one of the finest ports, or rather collection of ports, on the entire Pacific coast of the continent. It is upward of 50 m. in greatest length, by about 30 m. in average width. The entrance from the sea is 18 m. broad, between the volcanoes of Conchagua, 4,800 feet high, and Cosequina, 3,500 feet high. Two considerable islands, Conchagnita and Mianguira, lie across this entrance, dividing it into three channels, all practicable for the largest ships, and serving also to protect the interior of the bay from the swell of the sea. The three states of San Salvador,

Nicaragua, and Honduras touch on this bay, but the latter state has by far the largest frontage on it. Honduras has a coast line of about 400 m. on the bay of Honduras and the Caribbean sea, extending from the mouth of the Rio Tinto to that of the Rio Segovia, and of 60 m. on the bay of Fonseca on the Pacific side. It embraces the islands of Tigre, Sacate Grande, and Gueguensi, lying in the latter bay, and claims those of Ruatan and its dependencies, Guanaja, Utila, Helena, Barbaretta, and Morat, in the bay of Honduras, which form a British colony under the name of the Bay Islands. The rivers are numerous, and some of them are of large size. The Chamelicon, Ulua, Aguan or Roman, Tinto, Patuca, and Segovia, falling into the Atlantic, and the Choluteca, Nacaome, and Goascoran, flowing into the bay of Fonseca, are most important. The Ulua is largest, and drains nearly $\frac{1}{3}$ of the entire area of the republic. It is navigable for a distance of 70 m. from its mouth. The Aguan or Roman river, about 150 m. long, rises in the mountains of Sulaco, and falls into the bay of Honduras, a little E. of Truxillo. Its largest tributary is the river Mangualil, celebrated for its extensive gold washings. It is said to be navigable by boats of light draft for 80 m. above its mouth. The river Choluteca, about 150 m. long, is the largest stream of Central America falling into the Pacific, excepting the river Lempa. It rises in the Lepaterique mountains, and describes nearly a circle before reaching the sea. Its valley expands into broad and rich alluvial plains as it approaches the bay of Fonseca. Honduras has but one large lake, that of Yojoa or Tau-lebe, remarkable for its great elevation and the number of its subterranean outlets.—Honduras is traversed by ranges of mountains and hills, radiating from the Cordilleras. This great chain does not, however, approach within 50 or 60 m. of the Pacific, viewed from which it presents the general appearance of a great natural wall, with a lower range of mountains, relieved by volcanic peaks of wonderful regularity of outline, between it and the sea. The general direction of the true Cordilleras, or great dividing ridge which separates the waters flowing into one ocean from those falling into the other, is from N. E. to S. W. In the department of Gracias it sends off a dependent range, which at the point of separation is called the mountains of Merendon, afterward Grita, and nearer the coast the mountains of Espiritu Santo. On the coast itself, where it attains the height of from 7,000 to 9,000 feet, it is called the mountains of Omoa. Along its N. base flows the great river Motagna, and along its S. base the Chamelicon. Following the course of the Sierra Madre, we find it, at a distance of a few leagues from the mountains of Merendon, spreading out in a tangled mass or knot of mountains, called the mountains of Selaque. Intermediately lies the plain or *bolson* of Sensenti, 30 m. long by from 15 to 20 m. wide, with only one narrow outlet, through which it is drained by the Rio Higuato

or Talgua. The mountains of Selaque constitute one of the principal centres of elevation in Honduras, their summits rising to the height of between 8,000 and 10,000 feet. The valley of Rio Mejitote intervenes between these mountains and the scarcely inferior ones of Puca, and the terraced mountains of Opalaca and Intibucat, with their truncated summits and elevated plains. Next in order comes the valley of the Rio Santa Barbara, followed by the *bolson* of Otoro, separated from the great plain of Comayagua by a group of mountains known as the Montecillos. This plain completely interrupts the chain of the Cordilleras, and with the valley of the Rio Humuya extending from it northward to the Atlantic, and that of the Rio Goascoran, southward to the Pacific, it forms a great transverse valley reaching from ocean to ocean. It has an extreme length of 40 m., and a general width of from 5 to 20 m. Passing the plain of Comayagua, the Cordilleras are resumed in a great mass of high mountains, known toward the N. as the mountains of Comayagua, and on the S. as the mountains of Lepaterique. Beside these, standing nearly in the centre of the republic, is a group of lofty mountains called mountains of Sulaco. The N. coast of Honduras presents a diversified surface. A portion is flat and penetrated by lagoons, but generally it is undulating, or takes the form of successive tablelands of varying elevations. Topographically, therefore, the country has the greatest diversity of surface and of elevation; broad alluvions, fertile valleys, wide and elevated plains, and mountains terraced to their summits, affording almost every possible variety of climate, soil, and production.—The temperature is highest on the N. and E. coasts, and lowers rapidly as we advance inland. The range of the thermometer, at the port of Truxillo, for the year 1840-'41, was from 62° to 86° F.; in Omoa, for 1848, from 62° to 91°, the mean average for the year being 79°. The fall of rain for the same period was 47.2 inches, or but little more than $\frac{1}{4}$ of the average rain fall under the tropics, as computed in the tables of Prof. Johnston. In the central parts of the state, and on the Pacific declivity of the Cordilleras, the rain fall is less, and the average temperature considerably lower. What are called the seasons, here as elsewhere under the tropics, are divided into the wet and dry. The dry season, or summer, may be said to commence on the coast in December and terminate in June, the remaining months constituting the rainy season or winter. But the dry season has really a duration of but 3 months, February, March, and April; the rainy season an equal number, July, August, and September. Between these periods the rains are intermittent, alternating with days and often weeks of dry weather. On both coasts heavy dews fall during the night, so that vegetation is always luxuriant. But on the more elevated central plateaus, where the altitude exceeds 3,000 feet, the dews are slight, and the nights are nearly as dry as the days. Although the rains, especially those

which at the epochs of change fall in showers, are much heavier than those which prevail in the United States and in Europe, so that in a few minutes the earth is covered with water, yet they do not generally last for more than half an hour, and in a brief space the surface becomes, to all appearance, as dry as if no rain had fallen.—The productions of Honduras are as various as its altitudes and temperature. On the alluvions of the coast the staples of the tropics flourish, while on the high grounds of the interior the cereals and fruits of the temperate zone are produced. Mahogany, rosewood, logwood, fustic, lignum-vite, and other precious woods are found on the Atlantic coast, while the pine and oak abound in the interior. Sarsaparilla, vanilla, cacao, pimento, sugar cane, tobacco, the indigo plant, and cochineal are all indigenous, as are also numerous trees producing gums and resins, including the gum arabic, copaiba, liquidamber, dragon's blood, caoutchouc, annatto, &c.—In mineral resources Honduras ranks first of all the states of Central America. In consequence of the unsettled condition of the country, mining enterprise has greatly declined. Silver ores are abundant and valuable, the metal being found in combination with lead, iron, copper, and in a few instances with antimony. Gold mines are common; but most of the gold obtained is washed from the sands of the rivers of the departments of Olancho, Yoro, and Santa Barbara. There are also rich mines of copper, the ores in all cases containing a considerable proportion of silver. The copper ores of Gracias yield 58 per cent., and those of Olancho 80 per cent. of the pure metal. Iron ores are common, but none of the mines of this metal are worked, except those of Agalteca in the department of Tegucigalpa. They are highly magnetic, and are forged without smelting. Zinc occurs in various combinations, and superior ores of this metal are found in the islands of Ruatan and Guanaja. Antimony and tin also exist. Brown coal has been discovered in various localities, and large beds exist in the valley of Sensenti, department of Gracias. The opal mines of Gracias are extensively worked. An abundance of fine limestone is scattered over the state, and vast quarries of a superior marble occur near Port Cortes.—The cattle of Honduras constitute at present its most obvious source of wealth. The open character of the interior country, and its vast savannas covered with unfailing verdure, are circumstances favorable for the increase of this kind of property to an indefinite extent.—The fauna corresponds with the intermediate geographical position of the state, partaking of the character of that of the equatorial regions of South America on the one hand, and the semi-tropical districts of Mexico on the other. Thus we find the ant-eaters of the Orinoco on its northern and eastern coasts, and the gray squirrel of the northern regions among the forests of the interior. The deer, peccary, warree (*sus Americensis*), tapir, manatee, raccoon, opossum, armadillo,

and many varieties of monkeys, frequent the forests and jungles near the rivers and coasts; while the jaguar, ocelot, and cougar are found in more secluded districts. The most celebrated bird is the *quetzal* or *trogan resplendens*, found in the mountains of Sulaco, Comayagua, and Merendon, though other birds peculiar to both tropical and temperate climates abound. Alligators are found in the rivers and lagoons. The iguana sometimes attains the length of from 3 to 4 feet. The insect most dreaded in the country is the *langosta* or *chapulin*, a kind of grasshopper or locust from 2 to 4 inches long, which at intervals afflicts the entire country, destroying all vegetation.—The population is mostly Indian, and in some districts it is hard to say whether the whites have assimilated most to the aborigines in habits of life, or the Indians most to the whites. The eastern portion of the state, between the river Roman and Cape Gracias á Dios, comprising an area of 15,000 sq. m., is almost exclusively occupied by independent tribes, known under the general names of Xicaques and Payas. Portions of these have accepted the Roman Catholic faith, and live in good understanding with their white neighbors. Occasionally small parties come down to the coast, to work in the mahogany cuttings, and procure articles of steel and iron. When their engagements are concluded, they quickly return to their homes. They are described as "having long black hair, hanging over their shoulders, very broad faces, small eyes, with a peculiar expression of sadness and docility, which prepossesses the beholder in their favor." They are all cultivators of the soil, and are only secondarily hunters and fishers. The coast around Carataska lagoon, and near Cape Gracias, was for many years occupied by a mixed race of negroes and Indians, best known as sambos or sambo Mosquitos, corresponding generally with the people of the Mosquito coast. But of late years they have been gradually crowded out by the more vigorous race of the Caribs, who are spreading rapidly along the entire N. coast of Honduras. These are the descendants of the Caribs of San Vincent, one of the Leeward islands, who were deported by the English, to the number of 5,000, and landed on the island of Ruatan, in 1796. They are now estimated to number between 20,000 and 30,000. They are active, industrious, and provident. A portion of them have a mixture of negro blood, and are hence called the black Caribs. They still retain their original language, which is the true Carib of the islands, although most if not all of them speak Spanish as well as a little English. They profess the Catholic religion, but they are polygamists, and retain many of their native rites and superstitions. They work in gangs of from 30 to 50 men, under the direction of a "captain" chosen from among themselves. In the mountains of the departments of Gracias, Comayagua, and Choluteca, there are a number of purely Indian towns, in which the inhabitants retain their ancient languages and many of their prim-

itive habits. The elevated districts which they occupy enable them to cultivate wheat, potatoes, and other products of higher latitudes. They all profess the Catholic religion, but their forms of worship, and especially their music, are strongly impressed with aboriginal characteristics.—Honduras has some remarkable aboriginal monuments and remains, of which the best known and probably the most important are those of Copan, in the department of Gracias, near the frontier of Guatemala. They consist of several vast pyramidal structures, of which the *teocallis* of Mexico may be taken as the type, with remains of various edifices of stone. But the most interesting relics are a number of gigantic monoliths, elaborately sculptured, and loaded with hieroglyphic or symbolical figures. It has been supposed by some writers that these ruins are those of the town of Copan, destroyed by Hernando de Chavez in 1530; but a manuscript of the licenciado Palacios, auditor of Guatemala, written in 1576, gives an account of the ruins, which were then very nearly in their present condition. Palacios was unable to learn of any but the vaguest traditions concerning their origin; these were to the effect that the ancient city was built by a powerful lord who came from the direction of Yucatan, and who afterward returned to his native country, leaving the city he had built deserted. The hieroglyphical representations found on the monuments of Copan are identical with those of Palenque and the ancient Central American MSS. In the valley of the Rio Chamelicon, and also in the great plain of Sensenti, are similar remains, but in a more ruined condition. Near Comayagua, the capital of the state, in the centre of the plain of the same name, are other monuments, conspicuous among which is the fortified hill of Tenampua, covered with ruins.—Very few data exist for calculating either the amount or value of the industrial products of Honduras. The entire industry of the country is at a very low ebb. Its exports consist chiefly of bullion, mahogany, hides, sarsaparilla, tobacco, cattle, and a small amount of indigo. The annual value of these exports may be estimated approximately as follows:

Bullion	\$400,000
Mahogany and other woods	300,000
Cattle	125,000
Hides, sarsaparilla, &c.	300,000
Total	\$1,125,000

The value of the imports of the state is also to a great degree conjectural, owing to the fact that the customs, at several of the ports, are farmed out to individuals. The number of vessels entering the Atlantic ports of Omoa and Truxillo, with their tonnage, &c., for the year 1856, is given in the subjoined table:

Flags.	Vessels.	Tonnage.
Honduras	61	2,620
British	43	2,104
Spanish	16	838
American	9	1,674
Dutch	8	404
Total	142	7,660

The value of the cargoes of the vessels enumerated in this table, according to official returns, was \$294,255. In 1854 the value of the cargoes received at these two ports was \$635,594. Since then, however, the trade of the country has mainly gone to the Pacific coast. The imports of the state at large may be estimated at little short of \$1,000,000, chiefly from Great Britain. A great obstacle to the development of Honduras is the want of roads. At present these are mere mule paths, often conducted, to avoid large and rapid streams, over steep and high mountains, where they are narrow, abrupt, and dangerous. The loads carried by mules are necessarily light, and the expense of transportation is so great as effectually to prohibit the exportation of bulky products except from places near the coast. All articles of importation also, which cannot be packed on mules, require to be transported on the shoulders of men; and the pianos, mirrors, and other foreign articles of bulk and value in use in the larger towns of the interior, have all been carried in like manner from the seaport for distances varying from 60 to 100 m. The machinery for working the numerous mines of the country, in an adequate manner, is also excluded for the same reason.—As soon as the lack of a water communication between the Atlantic and Pacific oceans became acknowledged, the attention of the crown of Spain was directed toward the formation of an artificial channel, or at least an available route of transit, across the intervening continent. Within 40 years after the discovery, all the great lines which are now supposed to offer facilities for interoceanic communication had been carefully traced, and their capabilities very accurately pointed out. Among these was a route through Honduras, between Puerto de Caballos (now Port Cortes) and the bay of Fonseca. As early as 1540, Alonso de Caceres, one of the lieutenants of Alvarado, the conqueror of Guatemala, founded the city of Comayagua, the present capital of Honduras, in obedience to instructions "to find out an eligible situation for a town midway between the two seas." In 1586 the celebrated Italian engineer Battista Antonelli, the builder of the Moro at Havana, and of the original castle of San Juan de Ulua at Vera Cruz, was sent to America to make a new survey of the route in question. This he effected, in conjunction with one Juan de Texada, and their joint report still exists among the archives of the Indies in Seville. In 1854, Mr. E. G. Squier, at the head of a small corps of engineers, undertook a reconnaissance of the country, with a view of ascertaining the feasibility of a railway from sea to sea. More thorough surveys were subsequently made, a charter obtained from the government of Honduras, and a company organized to build the road. Starting from Port Cortes, on the Atlantic, the distance, in a right line to the bay of Fonseca on the Pacific, is 162 statute miles. Following the line of the proposed road, the distance is 205 miles. The summit level is 2,956

feet above the sea, but is reached by constant ascents from both oceans. The heaviest gradients are 95 feet to the mile. The estimated cost of the work, for a continuous railway from sea to sea, is \$10,615,000; or from the head of navigation on the Ulna river to the Pacific, \$8,104,000. It is proposed to terminate the railway on the island of Sacate Grande, which is only separated from the mainland by a creek, easily bridged. The depth of water in front is from 6 to 20 fathoms, and the channel, connecting with the open sea, has a depth throughout of not less than 5 fathoms. The charter of the Honduras railway is for a period of 70 years after the completion of the work, which must be finished by the year 1869. The ports at its extremities are to be constituted free ports, and all goods and passengers may pass over the road when completed free from government charges of all kinds, and without passports. It is claimed that the construction of the proposed railway will effect a saving, as compared with the route *via* Panama, between New York and San Francisco, of 1,100 miles in distance, and from 5 to 7 days in time.—The Roman Catholic is the only religion recognized by law in Honduras, but the private exercise of all kinds of worship is allowed. Both at the time of the independence and subsequently, the church throughout Central America took an active part against the liberal party and the new order of things. The consequence was the abolition of the convents, a confiscation of the estates belonging to them, and a forcible expulsion of a part of the priesthood. In 1832 the publication of papal bulls was prohibited throughout Central America, and religious freedom was unconditionally proclaimed by the federal congress. Honduras passed a law legitimizing the children of priests, entitling them to bear the names and inherit the property of their fathers, and declaring the cohabitation of priests with women to be an evidence of marriage in every legal sense, and subjecting them to all its responsibilities. These measures have since been modified, but the church is still supported by voluntary contributions, with a small annual appropriation on the part of the state.—Honduras has two universities, in Comayagua and Tegucigalpa. They have nominally professorships of law, medicine, and theology, but in fact their course of instruction is little in advance of that of the common schools of the United States. On a very liberal estimate, there may be 400 schools in the state, with an average of 25 pupils each, or an aggregate of 10,000 pupils of all classes. There are no libraries in the state worthy of mention, nor, beside the government official gazette, any newspapers.—The government is a republic. Each department is subdivided into districts, and is governed by an officer appointed by the central government, who bears the title of *jefe politico*, or political chief. Each department is entitled to one senator and two deputies. Senators must be 30 years of age, and proprietors to the value

of \$1,000, or members of some liberal profession. Deputies must be 25 years of age, and possessed of property to the value of \$500, or in the exercise of some profession or art which yields that annual return. The president must be a native of Central America, a citizen of the republic for 5 years, 32 years of age, and a proprietor of real estate to the value of \$5,000. He holds his office for 4 years, and is incapable of serving for two consecutive terms. The members of his cabinet have a seat *ex officio* in the legislature, but are not entitled to vote. The president has an absolute veto. The executive is surrounded by an intermediate body, called a council of state, which has all the powers of the legislature, subject to its revision whenever that body meets. Every male citizen over 21 years of age is entitled to exercise the right of suffrage; but the constitution provides that after 1870 the right to vote "shall be limited to such only as may then be able to read and write." All persons accused of crime must be examined within 48 hours after their arrest, and the judge must decide on their liberation or detention within the next 24 hours. Capital punishment is not allowed; and no known case of murder has occurred in the republic since the abolition of punishment by death. The national revenue amounts to about \$300,000, a large part of which is derived from the sale of domestic rum, which is a government monopoly.—Honduras was discovered by Columbus in 1502, when sailing on his 4th voyage; and it was here, at the point named by him Punta de Casinas (now Cabo de Honduras), that he first set foot on the American continent. He coasted along its shores to the eastward, and finally after great difficulty and danger, in consequence of adverse winds and currents, reached a point where the coast, abruptly trending to the southward, formed a cape, to which, in gratitude for his safety, he gave the name of Cabo Gracias á Dios, "Cape Thanks to God." In 1524 Cortes despatched one of his captains, Christoval de Olid, from Mexico to Honduras, then called Higuera or Hibueras (sometimes Ybueras), to make an establishment there in his name; but Olid evincing a disposition to set up authority on his own account, Cortes sent an armament, under the command of his own cousin, Francisco de las Casas, to replace him, or, if occasion should require, reduce him to obedience. Before the result of this expedition became known, and inspired by accounts of great and rich kingdoms in that direction, Cortes resolved himself to march into Honduras, overland. He started at the head of a considerable body of Spanish troops and Indian auxiliaries, from the isthmus of Tehuantepec, and boldly entered the vast and unknown wilderness which intervened between Mexico and the country of which he was in search. For two years he struggled among deep morasses, broad and almost impassable rivers, and high and desert mountains. At the end of that time he reached the point where Columbus made his first landing, and there,

after receiving the submission of the neighboring chiefs, he founded the ancient city, now the port of Truxillo. He also founded a town which he named Natividad, at Puerto Caballos (Port Cortes), "because," in his own language to the king of Spain, it was "the best part on all the coast of Tierra Firme yet discovered." Not long afterward, what is now known as Central America was organized as a dependency of the Spanish crown under the name of Audiencia de las Confinas, and the seat of the audiencia was fixed at Gracias á Dios in Honduras, whence it was afterward transferred to Guatemala. Since the revolution which resulted in its separation from Spain in 1821, Honduras has shared the vicissitudes of the other Central American states, but owing to its physical features it has suffered less from exterior violence than the neighboring republics. A claim was set up some years ago by Great Britain to a considerable portion of the coast of Honduras, from Cape Comorin or Cape Honduras, a few miles E. of the port of Truxillo, to Cape Gracias á Dios, on behalf of the supposititious "king of Mosquito." This claim was abandoned by the terms of a convention between Great Britain and Honduras, bearing date Aug. 26, 1856; and, although the convention was never ratified, it may nevertheless be accepted as a surrender of preëxisting pretensions.

HONDURAS, BAY or, a large triangular body of water, an arm of the Caribbean sea, lying between the republic of Honduras and the peninsula of Yucatan. It is remarkable for its great depth of water, which is assigned by some writers as originating the name Honduras (Sp. *hondura*, depth), subsequently applied to a portion of the mainland. The S. W. portion of the bay, penetrating into the continent, between Guatemala and Honduras, is known as the bay of Amatique. Along the coast of the peninsula of Yucatan, the bay is studded with coral cays or keys, which form an almost continuous line, at a distance of 10 to 25 m. from the shore, and act as a kind of natural breakwater to the continent. It was in the smooth water behind these cays that the buccaneers, well acquainted with the intricate channels between them, found refuge against the attacks of the Spanish fleets. Approach to the peninsula is at all times difficult and dangerous, and many vessels, proceeding to the English establishment of Balize, are annually lost in endeavoring to reach the coast. The most dangerous reefs or banks are those of Chinchorro, or the Northern Triangles. The bay on the side of Honduras, however, is open, the water deep, and navigation only impeded by the group of islands known as the Bay islands, which nevertheless are high, and easily avoided by mariners. The waters of the bay are generally tranquil, and storms are seldom known, except during the prevalence of the northers in the gulf of Mexico, which sometimes sweep over it, but with diminished force. Few of the cyclones of the Antilles reach the bay of Honduras.

HONDURAS, BRITISH, a name often given to the English establishment of Balize, and generally preserved in the royal and parliamentary documents referring to it. This establishment is separated from Honduras proper by the republic of Guatemala. The British authority over it was confirmed and established by treaty between Great Britain and Guatemala, signed May 1, 1859, with the following limits: "From the river Hondo on the N. to the river Sarstoon on the S., and inland as far as the meridian of Garbutt's falls on the river Balize, that meridian to constitute the W. boundary, from its point of intersection with the river Sarstoon to its point of intersection with the river Hondo." These limits comprise a district of about 200 m. in length by 60 m. in average width, or an area of not far from 12,000 sq. m. (See BALIZE.)

HONE, a stone of fine grit, used for sharpening the edges of steel instruments, and also for polishing the surfaces of hard materials. It is usually of slaty structure, and comes from some of the strata of the metamorphic slates. Talcoso slate of the finer varieties often affords a sharp and fine grit, owing to the exceedingly delicate grains of silica of which it is principally composed. Upon this intermixture of sharp particles with some softer material, and freedom from all coarse substances which give irregularity to the texture of the stone, the excellence of hones depends. The best of the class are the famous Turkey oil stones, which contain 72 per cent. of silica, 13.33 of lime, 10.33 of carbonic acid, and 3.33 of alumina; the lime and carbonic acid being in the proportions to form the soft mineral calcareous spar, which however is so intimately blended with the other ingredients, that the whole constitutes a mass of apparently perfectly homogeneous structure. Holtzapffel, who follows Mr. Knight in his paper in the "Transactions of the Society of Arts," vol. I., separates the Turkey oil stone from the hones because of its not possessing a slaty structure. As a whetstone he describes it as surpassing every other known substance, abrading the hardest steel, and being so close and compact as to resist the pressure necessary for sharpening gravers and the smallest instruments. It is obtained in Smyrna, to which place it is brought from the interior of Asia. The Arkansas stone is the best procured in the United States. It is much used here, and is known abroad. Holtzapffel speaks of it as of unequal texture and cutting slowly. The German razor hone is almost everywhere known as an excellent soft whetstone for all kinds of fine cutlery. It is found in the mountains near Ratisbon, occurring as a yellow vein in blue slate, sometimes only an inch thick, and again reaching 18 inches. It is quarried and sawed into thin slabs, which are usually cemented upon pieces of the blue slate. At the same locality are prepared for the use of jewellers thin slips of blue and gray polishing stones, put up in lengths of about 6 inches, and from a quarter of an inch to an inch or more in width. Other stones for similar uses are pre-

pared in Bohemia, and furnish with those from Ratisbon the chief supply of these utensils for jewellers. The Bohemian stones contain silica 79 per cent., water 14, alumina 1, lime 1, iron 4. Many other varieties of hones, chiefly from English localities, are noticed in Holtzapffel's work on "Mechanical Manipulations."

HONE, WILLIAM, an English author and publisher, born in Bath in 1779, died in Tottenham, Nov. 6, 1842. At the age of 10 he was placed with an attorney in London, but after the expiration of his apprenticeship he abandoned the law, was married, and in 1800 set up as a bookseller, with a circulating library, in Lambeth Walk. During the next 16 or 17 years of his life he experienced a succession of vicissitudes. Having no talent for business, he repeatedly became bankrupt, failed in almost every enterprise he undertook, and was obliged at the same time to support a large family. In 1817, however, he brought himself into great notoriety by the series of political satires entitled "The Political House that Jack built," "The Man in the Moon," "The Queen's Matrimonial Ladder," "A Slap at Slop," "The Political Showman," "Non Mi Ricordo," &c., some of which, with the aid of Cruikshank's illustrations, reached a sale of hundreds of thousands of copies. Among these were several in the nature of parodies on various parts of the "Book of Common Prayer," for the printing and publishing of which Hone was tried on 3 separate indictments in Dec. 1817. He defended himself with great skill, and was acquitted in each instance. His "Three Trials," describing the proceedings on this occasion, went through 19 editions before the close of 1818. His friends attempted to set him up in business as a book auctioneer, but in a few years he found himself the inmate of the King's Bench prison, where, during a confinement of about 3 years, he edited and published his "Every Day Book" (2 vols. 8vo., 1825-'7), his "Table Book" (8vo., 1827-'8), and "Year Book" (8vo., 1829), his most useful works, and those by which he will be longest known. Upon his release from prison he attempted to establish himself as landlord of the Grasshopper coffee house in Grace Church street, but failed completely. Finally he joined an Independent church, became qualified as a preacher, and officiated until an attack of paralysis made him a confirmed invalid. Among his other works were: "Ancient Mysteries Described" (8vo., London, 1823); an edition of Strutt's "Sports and Pastimes of the English;" and "Early Life and Conversion of William Hone."

HONESDALE, the capital of Wayne co., Penn., in the N. E. part of the state, at the confluence of the Lackawaxen and Dyberry creeks, 160 m. N. E. from Harrisburg, and 16 m. E. from Carbondale; pop. of the borough in 1850, 2,268; in 1859, about 6,000. The town however extends beyond the limits of the corporate borough, and in 1850 had a population of 4,004. It is an active business place, and the centre of extensive coal-mining operations,

which are carried on chiefly by the Delaware and Hudson canal company. A railroad connects it with Carbondale and Scranton, and the Delaware and Hudson canal unites it with the Hudson river at Kingston. A plank road has also been constructed from Honesdale to the New York and Erie railroad, 16 m. distant. The town is neatly built, and in 1859 contained 9 churches (1 Baptist, 1 Episcopal, 2 German Lutheran, 1 Methodist, 1 Presbyterian, 2 Roman Catholic, and 1 Hebrew), an academy, a bank, a foundry, tanneries, glass works, several mills, and 3 newspaper offices. It is rapidly increasing in population and importance.

HONEY, the saccharine juices of plants, collected by bees from flowers, and deposited by them in the waxen cells of the comb. These juices undergo some modification in the honey bag of the bee; but though their chemical character is somewhat changed, they still retain the flavor, and to some extent the peculiar properties of the plants from which they were collected. Under a powerful microscope the pollen that was mixed with the juices may be detected in the honey, and even referred to the particular kind of plant to which it belonged. The prevalence of certain varieties may determine what sort of localities—gardens, woods, or mountains—have been most frequented by the bees. Flowers of sweet perfume impart agreeable odor and flavor to the honey; so that the product of some districts is famed and prized, while the bees of others, drawing upon very different sources, give to the honey they make the disagreeable or even dangerous properties of the plants themselves. Thus the honey of Mt. Ida in Crete has been always held in the highest estimation, as also that of Narbonne and Chamonix; but the honey of Trebizond causes headache and vomiting, and possesses poisonous qualities, supposed to be derived from the *rhododendron*, *azalea Pontica*. Xenophon, in the "Anabasis," notices his soldiers being poisoned by eating such honey. Cases of the same character are recorded in the "New Jersey Medical Reporter," Nov. 1852. The substances recognized in honey are grape sugar, manna, gum mucilage, extractive, a little wax, pollen, acid, and odoriferous substances. When allowed to drain from the comb it is wholly fluid, and this, as well as the superior quality first made in the season, and deposited in the upper part of the hives, is known as virgin honey. But as ordinarily pressed out it holds a solid crystalline sugar, which may be separated by draining and pressing the fluid portion through a linen bag. The sugar is believed to be identical with grape sugar; but excepting its consistency and tendency to crystallize, it is not apparently different from the fluid honey. Their taste and chemical properties are the same. The proportion of crystallizable sugar increases with the age of the honey, so as to give it in time a granular character. The consistency of honey is thus very variable. The best and newest of the spring season is a clear fluid contained in a white

comb; older honey is yellowish and reddish. It is freely dissolved in cold water, and in this condition honey undergoes the vinous fermentation. Various substances are introduced into honey to add to its weight or to improve its color. Starch is most commonly employed, but chalk, plaster of Paris, and pipe clay are also used. The presence of such matters may be detected by dissolving some of the honey in warm water, and letting the mixture stand for the deposit to fall, when its character may be easily ascertained. The different sugars are also used as adulterants, the presence of all which may be detected either by microscopic observations directed to the forms and comparative sizes of the crystals, or to the presence of the sugar acari, or by the chemical tests also cited with the others by Dr. Hassall in his work, "Adulterations Detected." Starch sugar, possessing the same chemical properties as the sugar of honey, cannot be detected; but being often accompanied by sulphate of lime resulting from the materials used in its preparation, the presence of this is an indication of adulteration with starch sugar. From the remotest times honey has been employed as an article of food; and to the ancients in the absence of sugar, it was of greater importance than to the moderns. A land flowing with milk and honey was to them a region abounding in the chief necessities of life.—As an article of diet and of medicine, honey possesses the properties of sugar, and is perhaps more laxative. Many constitutions, especially those subject to dyspepsia, cannot resist its disordering tendency; but those accustomed to its use find it wholesome and agreeable. In medicine its use is principally as a vehicle for other more active substances; but its composition and action upon all constitutions being somewhat uncertain, a solution of pure sugar is generally preferred even for this purpose. When in combination with vinegar, the preparations are called oxymels. Honey is easily clarified by heating it in a water bath till it becomes so fluid as to be easily strained through flannel. The wax and lighter impurities may be removed by skimming, while the heavier substances sink to the bottom.

HONEY DEW. See BEE, vol. iii. p. 53.

HONEY GUIDE, a bird of the cuckoo family, and genus *indicator* (Vieill.). The bill is short, broad at the base, with the culmen curved; wings long and pointed, with the 1st quill nearly as long as the 3d, 4th, and 5th, which are equal and longest; tail moderate, emarginate in the middle, and rounded on the sides; tarsi very short, covered with transverse broad scales; toes unequal, the outer anterior one the longest; claws moderate and strong. About 10 species are described, inhabiting the wooded districts of Africa, India, and the Indian islands; they are about as large as a chaffinch, and fly chattering about the trees apparently in a state of great excitement in order to attract the traveler's attention; this effected, it flies in a certain direction toward the nearest wild bee's nest, now and then perching and looking back to see

if the person follows; arriving at the tree or deserted ant-hill containing the honey, it hovers over it pointing toward it with the bill, and, alighting on the nearest branch, anxiously and noisily awaits its share of the spoil. It sometimes attacks the nests on its own account when pressed for food, and is occasionally found dead within them, stung to death by the bees, and covered in by a vault of wax to prevent the inconveniences caused by decay. They will sometimes lead to 2 or 3 nests in succession. The natives of South Africa trust implicitly to their guidance in search of honey, and will leave almost any occupation to follow their course, uttering as they go several sentences which they believe have magic power. The unwary traveller, however, is sometimes led into danger by following this bird, and instead of wild honey finds a concealed crocodile or a crouching lion. Persons following it should answer its twitter by a constant whistle. The natives obtain the honey by first stupefying the bees by burning grass at the entrance of the nest. The flight of the bird is heavy, and for only short distances at a time; the nest is made in the holes of trees; the eggs are 3 or 4, and both sexes assist in incubation; the birds are usually seen in pairs.

HONEYSUCKLE, the name of several kinds of twining and other shrubs, with tubular flowers, many of them possessing fragrance, and all of them of much beauty. To the natural order *caprifoliaceæ* belongs the genus *Lonicera*, so named in honor of Lonicer, a German botanist of the 16th century. The trumpet honeysuckle (*L. sempervirens*, Aiton) is found occasionally on rocky places in Massachusetts, more abundantly near New York, and thence to Virginia and southward. Under cultivation its foliage falls off toward winter. The flowers are numerous, with scentless corollas, of a scarlet or deep red color outside, and yellowish within. The plant is a strong and vigorous climber, continuing to bloom from spring until autumn. There is a variety known with pale yellow blossoms, and when both are twined together and simultaneously in flower, the effect is pleasing. The woodbine honeysuckle (*L. grata*, Ait.) is also cultivated and prized for its fragrant flowers, of a white color fading into yellowish, borne in whorls in the axils of the uppermost leaves. The yellow honeysuckle (*L. flava*, Sims) is a native of the southern states, but has long been cultivated in Europe, and thence has been introduced into our gardens. Its flowers are in closely approximate whorls with corollas of a bright yellow, afterward turning to an orange color; deeply bilabiate, the tube hairy within. This very ornamental plant was first noticed in South Carolina as growing on Paris mountain; it was afterward collected from the same locality by Fraser, and carried to England. Its blossoms have a delicious fragrance. The small-flowered honeysuckle (*L. parviflora*, De Lamarck) has little beauty to recommend it, its stem being commonly like that of a straggling bush 2 to 4 feet high. It is found upon the

rocky banks of the Hudson river and of the Schuylkill, blooming in May and June. A variety (*L. p. Douglasii*, De Candolle), with greener leaves and dull purple or crimson-colored corolla, occurs from Ohio to Wisconsin. The hairy honeysuckle (*L. hirsuta*, Eaton) is a much more attractive species, having large, coarse, hairy leaves, and bright, orange-colored, open, gaping corollas, and climbing with stout stems to considerable heights; it is said to be found ranging from Maine to Wisconsin and northward. The English honeysuckle (*L. periclymenum*, Linn.) has its leaves all separate, deciduous, sometimes downy, ovate, obtuse, attenuate at the base, the upper ones the smallest. Its flowers are borne in terminal heads with corollas of deep red color externally; its berries are nearly globular, deep red, bitter and nauseous. Difference of locality seems to produce variations in its growth; when by the seaside the foliage is more glaucous and the flowers are smaller and greenish. The late red honeysuckle (*L. p. serotina*), producing a greater number of flowers of a reddish color, is but a variety of this introduced into England about 1715 by the Flemish florists. Another variety is the Dutch honeysuckle (*L. p. Belgica*), with smooth purplish branches, and flowers in terminal whorled heads, each corolla rising out of a scaly cover, reddish on the outside and yellowish within, of a very agreeable odor. It is sometimes called the monthly honeysuckle (Prince). There are still others, with smooth, with pubescent, and with variegated leaves. The common honeysuckle is a native of England, and is there likewise called the woodbine, a corruption of woodbind, from its habit of winding itself around every tree and shrub within reach. It is a favorite plant with the poets, and often enters into their descriptions. The Chinese honeysuckle is often to be met with in gardens, although only semi-hardy; it has deeply cut and lobed, dark purplish-green leaves, abundance of fragrant blossoms, and twines itself to a great height in a single summer. The goat's leaf or pale perfoliate honeysuckle (*L. caprifolium*, Linn.) has twining branches, deciduous, obovate, acutish, glaucous leaves, the uppermost broader and connate, the flowers ringent, terminal, disposed in capitate whorls, highly fragrant, 2 inches long, with a bluish-colored tube. It ranges from the middle and south of Europe to Siberia, and is found on Mt. Caucasus, and occasionally in England, apparently wild, but perhaps from seeds dropped by birds. The *Loniceras* are all easy of cultivation, rooting readily from the joints when buried beneath the soil, and especially if they are partly cut through; cuttings of the length of 3 or 4 joints, each end inserted in the ground, will also form new plants. The seeds germinate freely, and should be sown in the autumn.—The fly honeysuckles belong to another section of the order, and are species of the *xylosteum* of Jus-sieu. They grow into upright, bushy shrubs with straggling branches, with stems from 1 to

5 feet high, and are to be found in the rocky woods of the middle, northern, and north-western states. The bush honeysuckles (species of *Diervilla*, Tournefort) are low, upright shrubs, with ovate or oblong, pointed, serrate leaves, and yellowish flowers in cymes; the most common in our woods is *D. trifida* (Mönch), and is not an inelegant plant.—The false honeysuckles are represented in the azaleas, plants belonging to the natural order *Ericaceæ*. (See AZALEA.)

HONFLEUR, a seaport town of France, in the department of Calvados, situated on the S. bank of the estuary of the Seine, which is here 7 m. wide, and nearly opposite Havre, with which it has frequent communication by steamboat; pop. in 1832, 9,361. It has a commodious port, which is only accessible however at high tide, and is resorted to chiefly by fishing vessels and craft engaged in the timber trade. Its commerce, which was once important, is now engrossed by Havre, but it retains a trade in farm and dairy produce, about 360,000 dozen eggs being exported yearly to England. It has fisheries of herring, cod, and mackerel, and fits out whalers. There are large manufactories, ship-building yards, &c. The town is ill built and ill fortified, but contains some old and interesting edifices. The principal public buildings are the custom house, bank, hydrographical school, and a chapel on a neighboring hill which is a favorite shrine for sailors.

HONG, a Chinese word signifying a commercial establishment. At Canton the factories or warehouses occupied by the European merchants are called hong. Formerly the European trade at Canton on the part of the Chinese was granted by the government as a monopoly to 10 or 12 great merchants, called the hong merchants, through whose hands all foreign cargoes passed, and by whom the return cargoes were furnished. They became security for the payment of duties by the foreign ships, and maintained a high reputation for integrity. A few years ago this monopoly was abolished, and any merchant at Canton is now at liberty to engage in the foreign trade.

HONG KONG, a small island on the coast of China near the mouth of Canton river, about 40 m. E. of Macao, in lat. 22° 16' N., and long. 114° 22' E.; pop. about 40,000, mostly Chinese, with a few hundred Europeans and Americans. It has been a British possession since Jan. 1841. The island is 9 m. in length by 8 in breadth, and is separated from the mainland by a strait less than a mile in width. It is, for the most part, a mass of rocky hills, the highest of which attains an elevation of 1,825 feet above the sea. The rocks, which are chiefly granite, afford excellent and abundant building materials. The island produces the tropical plants common to the south of China, and the American potato and many of the fruits of Europe have been introduced by the British. The climate is hot, and in August and September is unhealthy. The colonial government is administered by a governor, an executive council of 3 members, and a

legislative council. The principal town is Victoria, on the N. side, a free port with considerable commerce, the arrivals of European and American vessels in 1853 amounting to 1,103, with a tonnage of 447,053 tons. Three semi-weekly journals are published in Hong Kong.

HONOLULU, capital of the Sandwich Islands, on the island of Oahu, lat. 21° 18' 12" N., long. 157° 55' W.; pop. about 10,000, and during the fall and winter season sometimes swelled to 12,000 or more by the influx of seamen and residents of other parts of the island. It possesses 6 churches, numerous schools for native and foreign children, a college, a medical school, and 3 weekly and 2 monthly journals in both the Hawaiian and English languages. Honolulu harbor, situated on the leeward side of the island of Oahu, was discovered in 1794 by Capt. Brown of the English ship *Butterworth*, who, together with Capt. Gardner of the *Prince Le Boo*, was murdered by the natives. The harbor is a deep basin in the coral reef, against which the swell of the sea breaks. The depth of water varies from 4 to 6½ fathoms. In 1858 the town possessed 4 ship chandlery stores, 20 importing houses, 50 to 60 retail stores, 12 hotels, 9 or 10 physicians, and 5 printing offices. The value of imports at Honolulu in 1857 was about \$1,100,000, about half from the United States, and the bulk of the rest from Great Britain; and of the exports \$600,000, about \$250,000 of which consisted of whale oil, sperm oil, and whale bone, and the rest of foreign goods reexported and of \$175,000 worth of domestic produce furnished as supplies to whalers and merchantmen. The custom house receipts in 1857 were \$131,403 16; the number of American whaling vessels was 128, French 8, other nations 8—total, 144; the number of national vessels was 12. In the 6 months ending June, 1858, 82 American vessels entered and cleared at Honolulu, with inward cargoes valued at \$200,000 and outward cargoes at \$400,000; in the preceding 6 months, 125 vessels, outward cargoes \$500,000, inward \$1,300,000. Honolulu is an important station of American missionaries, the seat of a Roman Catholic vicar, and the residence of the king and his government, and of the foreign consuls. It is a rapidly improving place.

HONORIUS, FLAVIUS, Roman emperor of the West, second son of Theodosius the Great, born in 384, died in Ravenna in 423. On the death of his father in 395 he succeeded to the possession of the West, and resided during several years of his minority at Milan, while his commander-in-chief and father-in-law Stilicho carried on the war against Alaric, king of the Visigoths. Stilicho was put to death in 408 on a charge of treason, and in 410 Rome was taken and plundered by Alaric. While insurrections broke out in many parts of the empire, and his general Constantius was able to protect only Italy and portions of the transalpine provinces, Honorius resided ingloriously in Ravenna.

HONORIUS (PORES). See PORE.

HOOD, ROBIN, an English outlaw, of whose actual existence but slight evidence can be discovered. The commonly received traditions concerning him are, perhaps, all embodied in the account of him given by Stow, as follows: "In this time (about the year 1190, in the reign of Richard I.) were many robbers and outlaws, among which Robin Hood and Little John, renowned thieves, continued in the woods, despoiling and robbing the goods of the rich. They killed none but such as would invade them, or by resistance for their own defence. The said Robert entertained an hundred tall men and good archers with such spoils and thefts as he got, upon whom 400 (were they never so strong) durst not give the onset. He suffered no woman to be oppressed, violated, or otherwise molested; poore men's goodes he spared, abundantlie relieving them with that which by theft he got from the abbeyes and the houses of rich old earles, whom Maior (the historian) blameth for his rapine and theft, but of all the thieves he affirmeth him to be the prince, and the most gentle theefe." The ingenious researches of modern scholars, however, now tend to make it a matter of doubt whether Robin Hood ever existed at all. He is supposed to have lived either in the time of Richard I., Henry III., or Edward II. But no contemporary writer makes any mention of him, the first allusion to him by any historical writer being in the *Scottichronicon*, which was written partly by Fordun, canon of Aberdeen, between 1377 and 1384, and partly by Bower, abbot of St. Columba, about 1450. He is next mentioned by Major, in his *Historia Majoris Britannia*, written in the early part of the 16th century. But, though unknown to sober history, the name of Robin Hood, in the ballad poetry and traditions of old England, has become a familiar household word; and whether the old chroniclers have only embodied the traditions of the ballads, or whether the ballad writers have commemorated the doughty exploits of some brave outlaw who really bore this name, is to the lover of poetry at the present day of but little consequence. Recent writers are inclined to regard him simply as the ideal of the outlaw class, embodying the hostility of the Saxons toward their Norman conquerors; a hypothesis which receives some support from the fact that hood and wood are interchangeable words, the one a corruption of the other, wood being still pronounced hood in some parts of England, and our own sailors calling the "woodends," *hoodens*; so that Robin Hood may mean only Robin of the woods. Kuhn, a German scholar, in an essay that throws much light upon English rural sports, suggests that he is substantially the same as the god Woden; and he offers some arguments which, though not convincing, yet deserve consideration. Following the old ballads, which bear the marks of an undoubted antiquity, we find that Sherwood forest in Nottinghamshire was his chief abode, and the theatre of most of his exploits, which have made him in all times a

great favorite of the common people, who have delighted to celebrate his memory in ballads and traditions. Though some modern antiquaries pretend that his name was Robin Fitz-ooth, and that he had some claim by descent to the earldom of Huntingdon, the older ballads make no such pretensions for him, and style him simply a yeoman. His most famous associates were "Little John," his chaplain Friar Tuck, who is supposed to have been a real monk, and his paramour Marian. Robin Hood is said to have been bled to death by a nun, his cousin, to whom he repaired for advice on account of her skill in medicine, and died at the nunnery of Kirk-lee, Yorkshire. An apocryphal epitaph, said to have been inscribed above his remains at that place, styles him Robert, earl of Huntingdon, and gives "24 Kal. Dekembris" (perhaps Dec. 24), 1247, as the date of his death. The exploits of Robin Hood seem to have been a favorite subject of ballad poetry as early as the time of Edward III., although many of these ballads, at least in their present shape, are comparatively modern. The "Lytel Geste of Robin Hood" was printed by Wynkin de Worde about 1495. A complete collection of the Robin Hood ballads, with "Historical Anecdotes," was published by Ritson (8vo., London, 1795), and enlarged by J. M. Gutch (2 vols. 8vo., 1847). In the collection of British ballads, edited by Prof. Child (8 vols. 16mo., Boston, 1856-'8), the 5th vol. contains the Robin Hood ballads.

HOOD, SAMUEL, viscount, a British naval officer, born in Butleigh, Somersetshire, Dec. 12, 1724, died in Bath, Jan. 27, 1816. He was the son of the rector of his native place, entered the navy at the age of 16, and, passing through the lower grades of the service, became post captain in 1756. In 1757 he was appointed to the command of a 50-gun ship, with which he captured a French vessel of equal size; and in 1759, having been transferred to the *Vestal* of 32 guns, and attached to the expedition sent against Quebec, he captured the French frigate *Bellona*, after a battle of 4 hours. On his return, Lord Anson, then first lord of the admiralty, presented him to King George II., who gave him command of the *Africa* of 64 guns. He was present at the bombardment of Havre, was employed 2 years on the coast of Ireland, and during the remainder of the war under Sir Charles Saunders in the Mediterranean. From Nov. 14, 1768, to July 13, 1769, he was at Boston, then occupied by British troops, as "commander-in-chief of all the men-of-war in those parts." During this time he was one of the four members of the committee of inquiry, in the celebrated affair of the *Rose* frigate, of which occasion John Adams said that "he had never taken such pains before or since, in any trial, as he did on this, to clear the accused." In 1773 he was made a baronet, and in 1780 rear admiral of the blue, with which rank he joined Rodney in the West Indies the same year. On April 28, 1781, he encountered De Grasse with a French fleet superior in numbers, but did not

hesitate to seek an engagement, which however the enemy avoided. He fought a drawn battle with De Grasse during the same year near Chesapeake bay, but could not prevent its blockade nor the surrender of the British army. In Jan. 1782, the French having invested the island of St. Christopher, Hood went to its relief. Having induced De Grasse to sail out from the road of Basse-Terre to join battle, he quietly slipped into the vacant anchorage, whence the French were unable to force him; but the surrender of the island to the French (Feb. 13) rendered his success useless, and he accordingly retreated at once to sea. The system of tactics which he at this time pursued indicated great bravery and shrewdness, and has been much commended by naval authorities. In the partial engagement with De Grasse on April 9, Hood, second in command under Rodney, distinguished himself by extraordinary bravery, his ship having through the engagement from 3 to 7 antagonists; and his efficient coöperation in the great battle of the 12th, which resulted in the capture of De Grasse, was warmly acknowledged by Rodney in his report to the admiralty. When Rodney returned to England, Hood was left in the chief command, until the peace of 1783. He was created an Irish peer, under the title of Baron Hood of Catherington, in 1782. In 1784 he was returned to parliament by the city of Westminster, but lost his seat on being made lord of the admiralty in 1788. He was reelected in 1790. When the war with France commenced in 1793 he was sent to the Mediterranean to aid the royalists of the south, who surrendered Toulon to him, which city he occupied for several months. During this time the republican government sent large forces to invest the city, and it was soon rendered untenable, and surrendered Dec. 18. Before embarking, Admiral Hood generously offered to carry away in his vessels all the French royalists desirous of leaving their country, and a large number availed themselves of this permission. He ordered the arsenal and dockyard to be destroyed. Of 56 French ships of war in port at the beginning of the siege, 6 were carried off by the English, 32 were burned, and 18 were saved by the French. In 1794 Hood expelled the French from Corsica, which was however soon retaken by them. In the same year he blockaded the port of Genoa, and kept in check the grand duke of Tuscany, who was favorably inclined toward the French republicans. His health failing, he returned to England and retired from active service. In 1796 he was appointed governor of Greenwich hospital and raised to the English peerage, with the title of Viscount Hood of Whitley.

HOOD, THOMAS, an English poet, born in London, May 23, 1793, died May 3, 1845. His father, who was a bookseller, died when he was but 12 years old. After acquiring the usual education, he was placed in a counting house; but the confinement of a mercantile life so affected his health that he was sent to Dundee to recruit,

where mountain tramps and roving on the Tay soon restored his strength, but rendered him unwilling to resume a commercial life. He made his first literary attempts here, in the "Dundee Magazine," and after two years' residence returned to London and engaged himself to an uncle, to learn the art of engraving. He continued his attempts at versification, which attracted some attention, so that in 1821 he was made sub-editor of the "London Magazine," which on the death of Mr. John Scott, who had fallen in a duel, had passed into the hands of some of Hood's friends. Through this connection he became acquainted with Charles Lamb, Hartley Coleridge, Hazlitt, Bowring, Talfourd, Cary, Procter, and other literary men who were among the contributors. With Lamb especially he contracted an intimacy which was uninterrupted until the latter's death. Hood's first book, "Odes and Addresses to Great People," was published anonymously, being in part the work of his brother-in-law, J. H. Reynolds. In 1826 he published a collection of miscellaneous papers under the title of "Whims and Oddities." His "National Tales" appeared in 1827, and in the same year he published a volume of poems, including the "Plea of the Midsummer Fairies," "Hero and Leander," and "Lycus the Centaur," which were praised by critics, but received with little interest by the public. Returning to his lighter and more popular style, he brought out a second series of "Whims and Oddities," which was followed in 1829 by a humorous poem called the "Epping Hunt." Hood edited the "Gem" for this year, and wrote for it his "Dream of Eugene Aram." In 1830 he began the publication of the "Comic Annual," which was continued through 10 volumes; and after an interruption of 2 years an 11th was issued in 1842. A selection of pieces from this work, with some additions, appeared in 12 monthly numbers in 1838-'9, under the title of "Hood's Own." In 1831 he removed to a pleasant residence in Essex, called the Lake house, where he wrote his novel of "Tylney Hall," but pecuniary troubles compelled him to leave it in 1835. In 1837 he made a tour on the continent for the benefit of his health, and remained abroad several years, publishing while in Belgium his "Up the Rhine," which was constructed, as he writes in his preface, on the groundwork of Smollett's "Humphrey Clinker." Returning to England, he became editor of the "New Monthly Magazine," from which he retired in 1843, collecting some of his contributions to its pages in a volume called "Whimsicalities." In 1844 he started "Hood's Magazine," which he continued to the time of his death; and in the same year appeared in "Punch" his immortal "Song of the Shirt," composed, like the "Bridge of Sighs" and the "Song of the Laborer," on a sick bed from which he never rose. About this time he received through the favor of Sir Robert Peel a pension of £100, which was continued after his death to his widow. The fullest collections of Hood's poems have been

made in Boston, one edited by Epes Sargent (4 vols., 1856) and another in Prof. Child's edition of the British poets (4 vols., 1857).

HOOFI, PIETER CORNELISZON, a Dutch historian and poet, born in Amsterdam, March 16, 1581, died at the Hague, May 21, 1647. He was carefully educated, travelled in France and Italy, and returned to Amsterdam in 1601. In 1609 the stadtholder Maurice appointed Hoofi *drossard* or bailiff of Muiden, and judge of Gooland, offices which he retained through life. He was on intimate terms with Grotius, who interested him in Galileo, and Hoofi did all in his power to induce the astronomer to take refuge in Holland. His death was made the subject of obsequies of a curious nature. Seven days after his decease the body was deposited amid an immense assembly of citizens in the choir of the new church of Amsterdam; and on the next day, in testimonial of grief, Adam van Sijmesz, an eminent actor, read in the theatre a funeral oration on Hoofi, written by Gerard Brandt, which was followed by the solemn performance of a tragedy written by the deceased. Hoofi has been termed the Homer and Tacitus of Holland, Van Kampen asserting that the Dutch language was rude and inflexible, its literature poor, without history, light or erotic poetry, and without a drama, until Hoofi gave them to it. He wrote, in the style of Tacitus, *Nederlandsche Historien* (Amsterdam, 1642). To acquire the style of his model, Hoofi is said to have read Tacitus through 52 times. He also wrote *Het Leven van Koning Hendrik IV.* (1626), and a history of the house of Medici (1649). His greater poetical compositions are the tragedies *Granida*, *Gerard van Velsen*, *Baete* (1628), and several minor pieces, one of which, *Warener met de Pot*, enjoyed in its day a high reputation.

HOOGLY, a district of British India, in the lieutenant-governorship of Bengal, bounded E. by the river Hoogly and S. by the Rupnarain; area, 2,007 sq. m.; pop. 1,520,840. It has a diversified surface, being low and flat in the E. and hilly in the W. and N. W., and is drained by the Hoogly, Dummodah, Rupnarain, and Dalkissore rivers. The soil of the low lands is fertile, and in some places is impregnated with salt. The most important productions are rice, sugar cane, indigo, cotton, tobacco, mustard, oil seeds, ginger, potatoes, garden vegetables, and hemp. Silkworms are reared, and silk is one of the principal articles of export.—HOOGLY, the principal town of the above district, is situated on the right bank of the river of the same name, 27 m. above Calcutta, with which it has communication by railway; pop. about 12,000. It contains a fine church built by the Jesuits in 1599, and a college erected in 1836, in which both English and oriental branches are taught. This institution is supported by endowment from the estate of a wealthy Mohammedan. The town was probably founded by the Portuguese in 1537. It was taken by Shah Jehan in 1632, when 1,000 Europeans were slaughtered and

4,400 made prisoners. The British established here in 1676 a factory, which, being fortified 5 years later, and furnished with a guard of 20 men, became the first military establishment of the East India company in Bengal. It was removed to Calcutta in 1686.

HOOGLY, a river of Bengal, British India, one of the deltoid mouths of the Ganges, formed by the junction, in lat. 23° 25' N., long. 88° 22' E., of two branches of the Ganges, the Bhagruttee and the Jellinghee. Its course is nearly S. with many windings, and it discharges its waters into the bay of Bengal by a broad estuary about 35 m. long and 15 m. wide at its mouth. The length of the Hoogly from the junction of its parent streams to the head of the estuary is 125 m. At Calcutta it is about a mile wide, and there is little increase in its size until it receives the Dummodah and Rupnarain, a short distance above its estuary. It is navigable by vessels of 1,400 tons as high as Calcutta, 100 m. from the bay, and ships of the line could formerly ascend to Chandernagore, 17 m. further. It is feared that the bed of the stream is being gradually filled up with mud and sand, and it has been proposed to construct a ship canal from Calcutta to the Mutwal, another mouth of the Ganges some distance to the eastward. The Hoogly is the only channel of the delta now frequented by large ships, though its mouth is much obstructed by shoals. The Hindoos regard it as the true course of the sacred Ganges, and consider the larger arm to the E. merely a branch of it. The tidal phenomenon called the bore is often witnessed in it.

HOOK, THEODORE EDWARD, an English author and journalist, born in London, Sept. 22, 1788, died in Fulham, Aug. 24, 1841. As a boy he showed extraordinary precocity, and a vivacity of temperament which rendered the task of instruction an impossibility. After a very inadequate education, terminating prematurely at Harrow, he rejoined his father, then musical director of Vauxhall gardens, and soon gave evidence of his talents by the production of several songs, for which he also composed the music. The success of these effusions made Hook ambitious to shine in a higher sphere, and when scarcely 16 he wrote a drama entitled "The Soldier's Return," which was well received. Elated by the extravagant praises of indulgent friends, he produced in rapid succession a number of farces and vaudivilles, and at an age when most boys are at school was a successful dramatist, the wit of the green room, and the companion of actors and playwrights. Yielding to the fascinations of such a life, he gradually enlarged the circle of his admirers by his facile humor, his astonishing faculty of punning, the audacity of his practical jokes, and his brilliant powers of improvisation, until he was welcomed to the most aristocratic society of London, and even attracted the notice of the prince regent, who sent him in 1812 to Mauritius as accountant general and treasurer with a salary of £2,000. Hook's previous course of life had not

been such as to qualify him to fill this office, and in 1818 he was brought back to England a prisoner under a charge of embezzling a sum of the public money estimated at £20,000, but which was subsequently reduced to £12,000. The law officer of the crown decided that there was no ground for a criminal prosecution, although his carelessness and incapacity were displayed to an extent almost incredible; and he was set at liberty and once more commenced the career of an author. In 1820 the "John Bull" newspaper was established, in the interest of the king, for the purpose of crushing the supporters of Queen Caroline, and Hooke's well known powers of satire and merciless ridicule suggested him as a fit person to conduct it. He performed the task with great adroitness, and the circulation of the paper gave him a handsome income. In 1823 the government reasserted its claim against Hooke, but after two years' confinement he contrived to procure a stay of proceedings, although he never made any attempt to discharge the debt. He was again welcomed to the society which his brilliant talents had formerly opened to him, and to the close of his life remained the professed diner-out and wit, tolerated in proportion to the amusement he could afford at the tables of his titled patrons. He employed his literary powers to some purpose, however, in the production of "Sayings and Doings," in 3 series, "Gilbert Gurney," "Maxwell," "Jack Brag," and a large number of other novels. Fashionable dissipation, high living, hard drinking, the excitement of the gaming table, and the constant mental strain to which he was subjected, gradually undermined a naturally strong constitution, and he ended his brilliant career, to adopt his own words, "done up in purse, in mind, and in body." In 1849 appeared the "Life and Remains of Theodore Hook," by the Rev. Mr. Barham (2 vols. 8vo., London).

HOOKE, NATHANIEL, a British historian, born in Ireland about 1690, died July 19, 1763. Concerning his private life very little is known, but a letter of his to Lord Oxford shows that he lost his entire fortune in the South sea speculation. He was then engaged by the duchess of Marlborough to assist in writing her memoirs, and received a compensation of £5,000. Being a zealous Catholic, he attempted the conversion of the duchess to that religion, and a quarrel was the consequence. He was a friend of Pope, and brought a priest to hear the confession of the poet in his last hours. The work by which Hooke is chiefly known is "The Roman History, from the Building of Rome to the Ruin of the Commonwealth" (4 vols. 4to., London, 1757-'71). In this history he adopts the opposite side to Middleton, and defends the plebeians against the patricians. He also wrote "Observations on Four Pieces upon the Roman Senate" (London, 1758), a work consisting of answers to treatises on the same subject by Dr. Middleton and Dr. Chapman; and translated into English Ramsay's *Vie de Fénelon* (1723), and the *Voyages de Cyrus* (1739).

HOOKE, ROBERT, an English mathematician and philosopher, born in Freshwater, isle of Wight, July 18, 1635, died at Gresham college, London, March 3, 1703. His father, a clergyman, had destined him for the church, but his health was too feeble to allow of his continuing his studies, and he devoted his leisure to mechanical inventions. In 1655 he was appointed assistant in chemistry to Dr. Thomas Willis at Oxford, and subsequently he assisted Mr. Robert Boyle. In 1664 he succeeded Dr. Dacres as professor of geometry in Gresham college. The same year, he was named by Sir John Cutler to his newly-founded professorship of mechanics in the royal society, and he delivered there his *Lectiones Cutlerianae*. In 1666, having suggested a plan for the rebuilding of London after the great fire, he was appointed city surveyor. In 1677 he succeeded Oldenburg as secretary of the royal society. In 1691 he was made a doctor of physic by a warrant from Archbishop Tillotson. He suggested the idea of replacing the balance of clocks by the pendulum, in order to secure a more exact measure of time, an idea which was enlarged and carried out by Huyghens. He also applied himself to devise some means to regulate watches, and when Huyghens in 1675 had some watches constructed, the balances of which were regulated by a spiral spring, Hooke was very indignant. He accused Oldenburg, secretary to the royal society, of having communicated to strangers discoveries deposited in the society registers. He was jealous of all other inventors, and was involved in continual disputes concerning different inventions, generally pretending that they were all taken from ideas of his own. He left numerous works, among which is his "Micrographia, or Physiological Descriptions of Minute Bodies made by Magnifying Glasses" (London, 1665). His "Posthumous Works, containing his Cutlerian Lectures and other Philosophical Discourses," were published in London in 1705.

HOOKER, JOSEPH DALTON, a British physician and botanist, son of Sir William Jackson Hooker, born in Glasgow in 1816. He studied medicine, but left his profession to devote himself to botany. He accompanied the antarctic expedition under Sir James Ross in 1839, nominally as assistant surgeon on the Erebus, but really to study the botany of the regions to be explored. The result was published under the title of "Flora Antarctica" (London, 1845-'8). In 1848 he travelled on a botanical expedition through the wildest parts of India and the Himalayas, during which he encountered many perils. He returned to England in 1852, and published his "Himalayan Journals," which are esteemed among the most interesting volumes of scientific travel written during the present century. He is fellow of the royal society and member of the Linnæan society. His principal remaining works are: "Cryptogamia Antarctica" (4to., 1847); "The Rhododendrons of Sikkim-Himalaya" (fol., 1849-'51); "Flora of New Zealand" (4to., 1852-'4); "Illustrations of Sikkim-Himalayan

Plants" (8vo., 1855); "Flora Tasmanica" (part I., 1855). Dr. Hooker was the first to introduce into England the great variety of Indian rhododendrons now so common.

HOOKER, RICHARD, an English divine, born in Heavystree, near Exeter, in 1553 or 1554, died in Bishopsbourne, near Canterbury, Nov. 2, 1600. The aptitude for learning which he displayed at school in his native town obtained for him the assistance of a wealthy uncle, by whom he was introduced to Bishop Jewel, who procured him a clerkship in Corpus Christi college, Oxford. He was admitted one of the scholars of that college in 1573, and a fellow and master of arts in 1577, was made deputy professor of Hebrew in 1579, was expelled from this office after 3 months with 4 other fellows of his college, but was immediately restored, and received holy orders in 1581. Being appointed to preach a sermon at St. Paul's cross, London, he lodged at the Shunamite's house, a dwelling appropriated to preachers, and was skilfully persuaded by the landlady "that it was best for him to have a wife that might prove a nurse to him, such an one as might prolong his life, and make it more comfortable, and such an one as she could and would provide for him if he thought fit to marry." The unsuspecting young divine agreed to abide by her choice, which fell upon her own daughter, who proved to be not only "a silly, clownish woman," but a Xantippe. Resigning his fellowship by his marriage, he was presented in 1584 to the living of Drayton-Beauchamp, in Buckinghamshire. There he was visited by two of his former pupils, Edwin Sandys and George Cranmer, who found him reading Horace while tending the sheep in the field, his servant having gone to aid Mrs. Hooker in the household labors. On repairing with them to the house, he was called away to rock the cradle, and the lady gave such other samples of hospitality as made them glad to depart on the following morning. To their expressions of commiseration Hooker replied: "If saints have usually a double share of the miseries of this life, I, that am none, ought not to repine at what my wise Creator hath appointed for me; but labor, as indeed I do daily, to submit to his will and possess my soul in patience and peace." Sandys made an appeal to his father, the archbishop of York, in behalf of his former tutor, who was promoted to the mastership of the Temple in London in 1585. The morning and afternoon lectureship belonged respectively to him and to Walter Travers, the one inclining to the Arminian view and maintaining the Anglican form of government, the other maintaining Calvinistic opinions and inclining to the Presbyterian form; and it was soon observed that "the forenoon sermons spoke Canterbury, and the afternoon Geneva." A controversy arose which was the occasion of Hooker's great work on "Ecclesiastical Polity." Archbishop Whitgift prohibited the preaching of Travers, who appealed unsuccessfully to the privy council, and published his

memorial, which, though answered by his opponent, gained for him many powerful adherents. "To unbegone and win over those of Mr. Travers's judgment, Hooker designed to write a sober deliberate treatise of the church's power to make canons for the use of ceremonies, and by law to impose an obedience to them, as upon her children." To secure the requisite quiet, he requested to be translated to some country parsonage, and received in 1591 the rectory of Boscombe, Wiltshire, where he completed the first 4 books of the "Ecclesiastical Polity" (London, 1594). In the following year he was presented to the rectory of Bishopsbourne, where he passed the remainder of his life. The last 4 books were published at intervals, 3 of them posthumously, and the 8 books were first collected in 1622. The 6th book is lost, that which passes for it having been proved to be a totally different production, and the 8th book seems to have been left incomplete. The first book presents much the finest examples of his eloquent and stately style. In this he maintains the eternal obligation of natural law and of the principles of right and wrong, arguing that even the Deity cannot depart from his immutable rectitude and holiness. In the second book he aims to refute a maxim common among the Puritans, that nothing is lawful, at least in matters of religion, which is not positively authorized by Scripture, and maintains the obligation as well of eternal and immutable laws. He proceeds to apply this distinction to ecclesiastical affairs, and develops his theory of the mutability of church government, though contending for episcopacy as an apostolical institution, and always preferable when circumstances allow it. "The finest as well as the most philosophical writer of the Elizabethan period," says Hallam, "is Hooker. His periods, indeed, are generally much too long and too intricate, but portions of them are often beautifully rhythmical. He was perhaps the first in England who adorned his prose with the images of poetry; but this he did so judiciously that we must be bigots in Attic severity before we can object to some of his grand figures of speech." His life was written by Izaak Walton. The latest edition of his works was arranged by the Rev. John Keble (3d ed., 3 vols., Oxford, 1845).

HOOKER, THOMAS, one of the first ministers of Cambridge, Mass., and also of Hartford, Conn., and one of the founders of the colony of Connecticut, born in Leicestershire, England, in 1586, died in Hartford, Conn., July 7, 1647. He is supposed to have been a cousin of the preceding. After being graduated at Cambridge, he took orders, preached in London, and was chosen lecturer at Chelmsford in 1626. Having been silenced by Laud for nonconformity, he established a grammar school, and about 1630 went to Holland, where he preached at Delft and Rotterdam, being an assistant to Dr. Ames, who said of him that "he never met with his equal, either in preaching or disputation." In 1633 he came to New England with

Cotton and Stone, and was settled with the latter at Newtown, now Cambridge, being ordained by the brethren of the church. In 1636 he removed with about 100 others to what is now Hartford, Conn., where he and Stone were the first ministers of the church. He was a remarkably animated and able preacher, of commanding presence and earnest zeal; he has been called the Luther of New England. It was his custom to preach without notes. Some 200 of his sermons were transcribed by John Higginson and sent to England, where about half of them were published. His most celebrated work, "A Survey of the Summe of Church Discipline," written in conjunction with John Cotton, was published in England under the supervision of Dr. Thomas Goodwin (4to., 1648). Many of his works have gone through repeated editions. A memoir of his life, with a selection from his writings, has been published by his descendant, the Rev. E. W. Hooker, D.D. (18mo., Boston, 1849).

HOOKER, SIR WILLIAM JACKSON, an English botanist, born in Norwich in 1785. He manifested a taste for botany at an unusually early age, and in 1809 he visited Iceland for the purpose of studying its natural history. The collection made with great pains during this visit was subsequently lost, but his copious notes and excellent memory enabled him to give an account of the botany of that region in his "Tour in Iceland" (2d ed., 2 vols. 8vo., London, 1813). He was subsequently engaged at different times in editing a continuation of Curtis's "Botanical Magazine," and from 1828 to 1833 the "Botanical Miscellany." He was for a long time professor of botany in the university of Glasgow, which position he exchanged for that of director of the royal gardens at Kew. He was knighted in 1836. His principal works are: "Monograph on the British Jungermanniæ" (London, 1812-'16); "Muscologia Britannica" (1818; new and enlarged ed. 1855); "Flora Scotica" (1821); "The Exotic Flora" (1823); "Flora Boreali-Americana" (1829-'40); "British Flora" (1830); "Illustrations of the Genera of Ferns" (1838-'42); *Victoria regia* (1851), and "Century of Ferns" (1854).

HOOLE, JOHN, an English translator and dramatic poet, born in London in 1727, died near Dorking in 1803. At the age of 17 he was placed as a clerk in the East India house, where he remained nearly 40 years, holding during the latter part of the time the position of auditor of Indian accounts. He devoted his leisure to the study of Italian, and published translations of the "Jerusalem Delivered" (2 vols. 8vo., 1763) and "Rinaldo" (1792) of Tasso, the dramas of Metastasio (2 vols. 12mo., 1767), and the "Orlando Furioso" of Ariosto (5 vols. 8vo., 1773-'83). Dr. Johnson valued his abilities highly, and wrote a dedication for the "Jerusalem Delivered;" but Sir Walter Scott speaks of Hoole as "a noble transmutter of gold into lead," and Southey alludes to the translation of the Orlando as "that vile version of Hoole's." The justice of these severe criticisms is now uni-

versally acknowledged, and his once popular translations have fallen into merited oblivion. Hoole edited the "Critical Essays of John Scott of Amwell," and wrote a life of that author (8vo., 1785). His dramatic works were three tragedies, "Cyrus," "Timanthes," and "Cleonia," none of which succeeded on the stage.

HOOOPER, JOHN, an English prelate, born in Somersetshire about 1495, executed in Gloucester, Feb. 9, 1555. He was educated at Oxford, and became a Cistercian monk. Returning to Oxford, he there embraced the doctrines of the reformation, but in 1539 accepted the appointment of chaplain to Sir John Arundel, which he was obliged to relinquish when his Protestant views were discovered. He then went to France, and afterward returned secretly to England; but being recognized he escaped to Ireland, and thence passed over to the continent, remaining in Switzerland until the accession of Edward VI., when he went back to England and preached the reformation in London. In 1550 he was nominated to the see of Gloucester, but refusing on conscientious grounds to wear the episcopal robes or to swear obedience to the metropolitan, and declaiming violently from the pulpit against the habits, the ordinal, and the council, he was imprisoned in the Fleet, Jan. 27, 1551. After two months' confinement his objections were overcome. Fourteen months later he received the bishopric of Worcester *in commendam*, in addition to that of Gloucester. On the accession of Queen Mary he was one of the first to suffer. He was deprived of his see, and in July, 1553, was cast into the Fleet prison. On Jan. 23, 1555, he was summoned with 5 other reformed clergymen before a spiritual court over which Gardiner presided. One of the prisoners recanted; one begged for time; Hooper, Rogers, Saunders, and Taylor replied that their consciences forbade them to subscribe to the doctrines established by law, and they were consequently excommunicated and condemned to the stake. Hooper met his fate with great firmness. He was a voluninous controversial writer, and a collection of his works in 2 vols. 8vo. was issued by the Parker society in 1843 and 1852.

HOOOPER, WILLIAM, an American revolutionary patriot, one of the signers of the declaration of independence, born in Boston, Mass., June 17, 1742, died in Hillsborough, N. C., in Oct. 1790. He was graduated at Harvard college in 1760, studied law with James Otis in Boston, and removed permanently to Wilmington, N. C., in 1767, where he soon rose to professional eminence, and was noted for his social qualities and hospitality. He was delegated to the continental congress in 1775, and was till his death a leader in the councils of North Carolina.

HOOPING COUGH. See WHOOPING COUGH.

HOOPOE, a tenuirostral bird of the order *passeres*, and family *upupidæ*. The family includes the sub-families *upupinæ* or hoopoes, and *epimachinæ* or plumed birds of New Zealand and Australia; the former comprise the genera *upupa* (Linn.), *irrisor* (Less.) of Africa, and *fal-*

culia (Geoffr.) of Madagascar. The genus *upupa* is characterized by a long, slender, slightly curved bill, with acute tip; wings long and rounded, with the 4th and 5th quills equal and longest; tail long, broad, and even; tarsi shorter than middle toe and strong, and toes moderate. About half a dozen species are described in Europe, Asia, and Africa; they are migratory, preferring moist places on the border of woods; their food consists of insects, worms, and caterpillars, which they seek on the ground and among the foliage; their flight is very undulating, on which their principal safety from birds of prey depends; the nest is made in the holes of trees and crevices of rocks, and is composed of dried grasses lined with softer materials; the eggs are 4 or 5 in number. These birds sometimes congregate in small flocks. The tenuirostral tribe, which includes the humming and sun birds, the birds of paradise, the honey suckers, and other brilliant species, belongs almost entirely to tropical climates. The hoopoe, however (*U. epops*, Linn.), is found even in northern Europe, whither it comes in summer from Asia and northern Africa. The bird is about the size of a thrush; the head, neck, back, and breast are reddish gray, with tints of vinous purple, shading into pure white on the belly and vent, where the centre of the feathers is dashed with dark brown; the rump is white; the wings black, when closed exhibiting 5 white bands; tail black, with an angular white band across the centre, and the outer feather narrowly edged with the same; there is an ample crest of erectile feathers, of an orange brown color of varying intensity, nearly white at the end, with a terminal oval black spot. The female is less bright, and her crest is smaller. It is a handsome and sprightly bird, and of use to man in destroying larvæ and insects.

HOP (old Germ. *Hoppe*, and afterward *Hopfen*), *humulus lupulus*, a plant of the Linnæan class *diœcia* and order *pentandria*, and of the natural order *urticaceæ*. The flowers of the male plant have a calyx of 5 leaves and no corolla; those of the female plant have for their calyx the scales of an ament, each 2-flowered, styles 2, seed 1. They form a foliaceous cone or strobile, called also catkin, for the sake of which alone the plant is cultivated. The catkins consist of the scales, nuts, and lupuline grains or glands. The scales are bracts enclosing the nuts, which are small and hard. They are covered at their base with an aromatic resinous substance of yellowish color known as lupuline. This constitutes about $\frac{1}{4}$ of the weight of the dried catkins, and contains the greater portion of their valuable qualities. The hop is a vine, with a perennial root from which spring up numerous annual shoots, forming slender flexible stems, angular and rough to the touch. These climb spirally upon trees or around poles to the height of 20 or 30 feet. The leaves are opposite on long winding petioles, the smaller ones heart-shaped, the larger 3 or 5 lobed. The

hop is found wild in the eastern states, and on the banks of the Mississippi and Missouri, and also in many European countries. It has long been cultivated in Germany, where its use is traced back as far as the 9th century. In other countries it has become an important agricultural product, and in the United States³ is now largely cultivated in New England, New York, Indiana, and Ohio, beside being imported from Great Britain. The English, who have carried its culture to the greatest perfection, are supposed to have first engaged in it in the reign of Henry VIII., about the year 1524, having learned from people of Artois its qualities of preserving beer from fermentation and imparting an agreeable bitter flavor to the liquor. The S. E. part of England was found particularly favorable for the crop; and in the county of Kent alone, it is believed, from 25,000 to 30,000 acres have long been appropriated to it. Hop plantations of great extent are also found in Sussex and Herefordshire, and there are smaller ones in many of the other counties; but the production of Kent probably represents one half of the whole amount raised in England. In ordinary seasons this county supplies nearly enough hops for all the malt liquors brewed in England; but the crop is very fluctuating, and in seasons of scarcity hops are imported from Belgium, and also a small amount from the United States. The Belgian hops have a good reputation; but those of Bavaria are the best of all, the aroma being more perfectly preserved by the method of preparation in practice there. The American hops are said to be very powerful, with a flavor so rank and peculiar, that unless greatly improved by cultivation they are not likely to find a large demand. The situations selected for hop gardens are the sunny slopes of hills, upon which the soil is light and loamy, and the sub-soil dry. The plants are set 3 or 4 seedlings together in a hill, the hills and rows of hills being 5 or 6 feet apart. Each hill is provided with 3 or 4 poles, which the first year need be only 5 or 6 feet long; but as the vines in a few years attain greater size, poles are then required of double the length named. In the autumn they are removed and stacked up. The ground is dug over in the winter, and during the summer is kept free from weeds. The plants do not produce a full crop for 4 or 5 years after planting, and their production is always very precarious. They are subject to blight of various kinds from mould or rust, and the devastation of the fly which attacks rose plants. This insect probably destroys more than half the crops, and full half the remainder is lost by unfavorable seasons and other causes. When the hops are mature the poles are pulled up with the vines hanging to them, and women and children gather the strobiles, which are immediately carried to the kilns called hop-oasts, in which they are dried upon a floor of wire or hair cloth at a heat not exceeding 120° F. Fumes of burning sulphur are admitted to the hops while drying, by which they are partially bleached. They

are then packed tightly in bags or pockets with the aid of the hydraulic press, and the parcels are made so compact, that they may be cut into blocks with a knife. The bales may be kept for years in a dry airy situation. The Belgians follow the same practice; but the Bavarians, when the hops are ripe, cut off the plants close to the ground, and leave them upon the poles to dry in the sun. This is thought to preserve better the aroma and essential oil, the hops, though packed loosely in bags, having more strength and flavor than the English or Belgian. In Herkimer co., N. Y., where hops are cultivated to considerable extent, a substitute for hop poles has been introduced by Mr. Thomas D. Aylsworth, and is generally adopted for the sake of its greater convenience and economy. Stout posts are set through the hop fields 6 or 8 rods apart in rows; and a wire is stretched along the tops of the posts. From the wire strings are carried down to short stakes driven into the ground. The vines climb the strings readily. When the hops are ripe for picking, the wires are loosened, and as many strings are unhooked as may be convenient for the pickers. A cheap clamp secures the wire to each post, so that only the portion between two posts need be loosened at once.—The quality of hops is judged of by the weight of the bags, the heavier samples having more of the lupuline or hop dust, one pound of which is considered equal to 4 lbs. of the strobiles deprived of it. They should be free from greenish particles in the flower, but full of hard seeds and pollen, and have a clammy feel. Being greatly injured by dampness, the presence of a crust thereby produced should be particularly looked for. As hops are sold, the packages are found to consist of the separated leaves of the cones of a pale yellow greenish color, possessing a strong fragrant odor, and with a very bitter and aromatic taste, beside the peculiar flavor which characterizes the plant. The essential properties of the hop, its bitterness and fragrance, appear to reside in the resinous substance which is found in minute yellow globules on the outside and near the base of the scales or thin leaves, constituting about $\frac{1}{4}$ to $\frac{1}{6}$ of the whole weight. This substance was noticed by Sir J. E. Smith of England and M. Planché of France, but its properties were investigated by Dr. A. W. Ives of New York. Obtained in the form of a fine yellow powder by rubbing the hops in a coarse canvas bag, and shaking the powder through, the resinous matter agglutinates by moderate heat and burns readily with a white flame. Dr. Ives called this substance lupuline, but this name is more properly applicable to the bitter principle it contains. In 120 grains he found 5 of tannin, 10 of extractive, 11 of bitter principle, 12 of wax, 36 of resin, and 46 of lignin. A volatile oil also has been separated by Payen and Chevallier, by distillation of the resinous powder. This oil is yellowish, and has an acrid taste with the odor of hops. The oil and the bitter principle impart the virtues of the hops

to water and alcohol. The separation of the resinous powder and its use in commerce instead of the hops was strongly recommended by Dr. Ives, on the score of economy in saving transportation, handling of bulky materials, and absorption of wort. Hops are frequently treated with sulphurous acid to give them a fresh appearance; but by this they are seriously damaged, and purchasers should be on their guard against the fraud, testing suspected samples for this acid.—Beside their use for preserving and flavoring malt liquors, hops have a reputation in medical practice as a tonic. In the western states some practitioners regard them as inferior only to quinine in anti-periodic powers. Dr. Jacob Bigelow ("American Medical Botany," vol. iii. p. 168) speaks favorably of the use of the fermented decoction known as hop beer, prepared from decoction of hops with addition of molasses, for dyspeptic complaints, promoting digestion when taken as a common drink at meals, and obviating the lassitude and debility felt by many in the spring and warm weather. The tincture operates in a moderate degree as a narcotic also; and as an external application to swellings and local pains, hops are advantageously used in poultices and fomentations for their sedative effect. A pillow of hops is a favorite remedy with many for restlessness, being thought to conduce to sleep in nervous complaints. The medicinal effects of hops, it is found, may be conveniently obtained by the use of the resinous substance, lupuline, which is prepared by rubbing the powder in a warm mortar until it becomes plastic, and then working it into pills; these may be given in doses of 6 to 12 grains. The young shoots of the hop are sometimes eaten for food, being prepared like asparagus. The fibres of the vine are strong and flexible, and have been woven into coarse cloth, which served for the sacks in which the hops are carried to market.—The production of hops in the United States in 1850 was as follows:

States.	Lbs.
New York.....	2,536,299
Vermont.....	288,023
New Hampshire.....	257,174
Massachusetts.....	121,595
Indiana.....	92,796
Ohio.....	63,731
Maine.....	40,120
Pennsylvania.....	22,088
Other states.....	75,024
Total.....	3,496,950

New York produced 7,192,254 lbs. in 1855, and Massachusetts 174,360 lbs. in 1855, 60,958 in 1856, 354,667 in 1857, and 131,825 in 1858. The following table comprises the statistics of hop culture in Great Britain for 5 years, and the amount of revenue derived from it, the duty being 2 pence per lb. and 5 per cent. additional:

Years.	Arres under cultivation.	Lbs. of hops charged with duty.	Amount of duty.
1853.....	49,367	31,751,693	£277,524
1854.....	53,523	9,577,126	86,422
1855.....	57,757	83,221,304	723,183
1856.....	54,527	55,868,624	488,850
1857.....	50,975	19,671,056	417,526

The import of hops into Great Britain amounted to 15,987 cwt. in 1856, and 18,711 cwt. in 1857.

HOPE, THOMAS, an English author, born about 1770, died Feb. 3, 1831. As a member of the great mercantile family of Amsterdam, he inherited a princely fortune, and at the age of 18 started on a tour of observation among the architectural remains of Europe and the East. During an absence of 8 years he visited southern Europe, Egypt, Barbary, and Asiatic Turkey, and returning to London purchased a house in Duchess street, Portland place, which he proceeded to remodel and furnish according to the ideas he had formed on his travels. A distinguishing feature was the long galleries and the series of cabinets stored with pictures, statuary, and objects of art and *virtu*. In 1807 he published "Household Furniture and External Decorations," with 60 plates, in which a full description of his own establishment is given, with hints for the decoration of houses. It was severely ridiculed by the "Edinburgh Review," but effected a reform in the internal arrangements of English houses. In 1809 appeared his "Costume of the Ancients" (2 vols. 8vo.; 3d ed. with considerable additions, 1841), a magnificent work, containing 321 plates, which was followed in 1812 by "Designs of Modern Costume," &c. Both are profound and exhaustive works, and are still regarded as standard authorities. After an interval of 7 years Mr. Hope astonished the world by the production of his "Anastasius, or Memoirs of a Modern Greek, written at the Close of the 18th Century" (3 vols. 8vo., 1819), a work which at first was generally attributed to Lord Byron. Sydney Smith said it was "full of marvellously fine things," and wondered that the man who had "meditated on muffineers and planned pokers" could have written any thing so eloquent; and Byron is known to have been flattered with the imputation of the authorship of the work. It has not, however, retained its popularity, and is now seldom read. Nothing of importance appeared from his pen during the remainder of his life; but shortly after his death two posthumous works were published: "Essay on the Origin and Prospects of Man" (3 vols. 8vo., 1831), unphilosophical in character and frequently paradoxical, but containing occasional passages of much eloquence; and a "Historical Essay on Architecture" (2 vols. 8vo., 1837), which has proved a popular treatise, and has passed through several editions. Mr. Hope was a liberal patron of art, being the first to discover and appreciate the genius of Thorwaldsen, who executed for him his "Jason;" and he collected one of the finest private galleries of pictures in Europe. His wife was of remarkable beauty, and was remarried after his death to Viscount Beresford. She died in 1851.—His eldest son, Henry Thomas Hope of Deepdene, late M.P. for Gloucester, is a well known conservative politician, as well as his youngest brother, Alexander James Beresford Beresford-Hope.

The latter assumed his mother's name Beresford by royal license in 1854. He was a member of parliament for Maidstone from 1841 to 1852, and was reelected in 1857. He is the author of "Essays" (London, 1844), and is celebrated for his munificent restoration and endowment of St. Augustine's abbey, Canterbury, as a church of England missionary college. Another brother, Adrian John Hope, married Matilda, Countess Rapp, a daughter of Gen. Rapp.

HOPE, THOMAS CHARLES, a Scottish chemist, born in Edinburgh, July 21, 1766, died there, June 13, 1844. His father, Dr. John Hope, was professor of botany in the university of Edinburgh. In 1787 the son was appointed to the chemical chair in the university of Glasgow. About the same time he became a convert to Lavoisier's theory of combustion and oxygenation, and was the first British chemist who publicly taught it. In 1795 he became assistant to Dr. Black, professor of chemistry at Edinburgh, upon whose death in 1799 he succeeded to the chair, which he filled until the end of the session of 1843. As a teacher and lecturer he has had few equals, and his lecture room was frequently uncomfortably crowded by pupils. His principal discovery was the presence of a new earth, named by him strontites, in a mineral found in the strontian lead mines in Argyllshire. He produced interesting papers on the "Point of Greatest Density in Water," on the "Colored and Colorable Matter in Leaves and Flowers of Plants," &c., on the "Chemical Nomenclature of Inorganic Compounds," &c., and others on subjects of natural philosophy, which have appeared in the "Transactions" of various learned bodies.

HOPE, WILLIAM WILLIAMS, a member of the Hope family, as noted for his enormous wealth as for his eccentricities, died in Paris in 1854. His collection of paintings and drawings was sold by auction in Paris, and the sale of his personal property at Rushton hall (an estate which he bought in 1828 for £140,000, and resold to Miss Clara Thornhill, the present owner, for £165,000) occupied 10 days. To Mlle. Amélie Chamerlat de Sabran, who had lived with him 18 years, he is said to have left a sum of 375,000 francs. After the revolution of 1848 he lived in retirement, but previous to that time he was a conspicuous *habitué* of the most select circles of Paris. He is said to have for several years confined his invitations, in his own house at least, to ladies, and to the number of 18, which his table could accommodate, and always the same persons except when death or some other circumstance created a vacancy. The most talented and charming women were among his favored friends, and he is reported to have left a legacy to each of the 18 ladies who were his habitual guests.

HOPE AND COMPANY, a firm of Amsterdam bankers, established in the 17th century by Henry Hope, a Scottish gentleman, a descendant of John de Hope, who came in 1537 from France to Scotland in the train of Madeleine,

queen of James V. One of the leading members of the house in the early part of the 19th century, when it was in the zenith of its prosperity, was Mr. Henry Hope, who was born in the United States, the son of a Scottish loyalist who had settled in Boston, Mass. This Henry Hope lived some time in Quincy, Mass., and was a poor youth when he emigrated from that place to England in the latter part of the 18th century. Mr. John Williams, an Englishman, who married his niece, and who assumed the name of John Williams Hope, and afterward that of John Hope, was the manager of the establishment. Among the silent partners of the concern were Adrian Hope, Henry Philip Hope, and Thomas Hope, the author of "Anastasis." The ablest active partner in the firm was Mr. Peter Caesar Labouchere, who had first entered it in the capacity of a clerk, and who married in 1796 a daughter of Sir Francis Baring. The relationship with the Baring family was continued by his son, the present Rt. Hon. Henry Labouchere, whose first wife was a daughter of Sir Thomas Baring. In concert with the house of Baring, the Hopes negotiated the great loan with France after the withdrawal of the allied armies, and several other loans. The governments with whom the house of Hope entertain the most intimate financial relations are those of Holland, Russia, and Spain. The Hope certificates, as the stocks are called, which the Russian government has given to the Dutch bankers in acknowledgment of its debt, amount to about \$25,000,000. Although much less wealthy and influential than the Rothschilds, the Hopes hold in some respects a position superior to the Jewish bankers. A splendid villa built in 1782 for one of the Hopes near Haarlem, at a cost of \$200,000, was purchased by Louis Bonaparte, the father of Napoleon III., and now belongs to the Orange dynasty. Sir Archibald Hope of Craighall, Fifeshire, and the earl of Hopetoun (John Alexander Hope), are the present representatives of the English and elder branch of the Hope family.

HOPKINS. I. A N. E. co. of Texas, drained by Sulphur fork of Red river; area, 952 sq. m.; pop. in 1858, 6,949, of whom 676 were slaves. It has a diversified surface occupied by prairies and timber lands, and is generally fertile. The productions in 1850 were 48,453 bushels of Indian corn, 3,215 of oats, 7,557 of potatoes, 37,674 lbs. of butter, and 6,769 of wool. Value of real estate in 1858, \$589,727. Capital, Tarrant. II. A W. co. of Ky., bounded N. E. by Green river, E. by Pond river, and S. W. by Tradewater creek; area, 474 sq. m.; pop. in 1850, 12,441, of whom 2,192 were slaves. It has a fertile soil and an uneven surface, diversified by hills which contain iron ore. Anthracite coal is also found in the county. The productions in 1850 were 741,032 bushels of Indian corn, 61,901 of oats, 2,180,699 lbs. of tobacco, and 23,654 of wool. There were 8 saw mills, 6 grist mills, 24 churches, and 2,310 pupils attending public schools. Capital, Madisonville.

HOPKINS, EDWARD, second governor of the colony of Connecticut, and a benefactor of Harvard college, born in England in 1600, died in London in 1657. He was a prominent merchant of London, and came to Boston in 1637, but soon after removed to Hartford, where he was chosen a magistrate in 1639, and governor of the colony every other year from 1640 to 1654, alternating with Haynes. He afterward went back to England, where he was chosen warden of the English fleet, commissioner of the admiralty and navy, and member of parliament. But he never lost his interest in the colonies, and at his death bequeathed much of his estate to New England, giving £1,000 for the support of grammar schools in Hartford and New Haven, which are still kept up, and £500 which went to Harvard college and the grammar school at Cambridge.

HOPKINS, ESEK, first commodore of the American navy, born in Seitate, R. I., in 1718, died in North Providence, Feb. 26, 1802. On the breaking out of the revolutionary war he was commissioned by Gov. Cooke as brigadier-general in command of 5 companies to be raised for the protection of the colony. Shortly after this appointment, in Nov. 1775, he received a commission from the continental congress as commodore and "commander-in-chief" of the navy, soon after which he put to sea with the first squadron sent out by the colonies, consisting of 4 ships and 3 sloops. Paul Jones was a lieutenant on board the commodore's ship, the Alfred, and Captains Whipple and Biddle commanded two others. Of the 18 commissioned officers in the fleet, 8 belonged to Rhode Island. The fleet sailed for the Bahama islands, and captured the forts at New Providence, and with them 80 cannon, and a large quantity of ordnance, stores, and ammunition. On his return, when off Block island, the commodore took the British schooner Hawke of 6 carriage guns and 8 swivels, and the bomb brig Bolton, of 8 guns, 2 howitzers, 10 swivels, and 48 men, and well found in ammunition and stores. For this act the president of congress complimented Hopkins officially. The particulars of this engagement were given by Paul Jones. Two days afterward, with 3 vessels, he attacked the Glasgow, of 29 guns; but she escaped, and for this the commodore, and particularly Capt. Whipple, were censured. The latter demanded a court martial, the request for which was forwarded to the president of congress. In the letter of the president to Com. Hopkins he says: "Though it is to be regretted that the Glasgow man-of-war made her escape, yet as it was not through any misconduct, the praise due to you and the other officers is undoubtedly the same." Commodore, or Admiral Hopkins, as he was generally called (even by Washington, who so addressed him in his official letters), performed other remarkable exploits, though he had great difficulties to contend with. His name became a synonyme for heroism, and for American patriotism. In June, 1776, Hopkins was ordered by

congress to appear before the naval committee in Philadelphia to reply to charges which had been preferred against him for not annoying the enemy's ships on the southern coast. He was defended by John Adams, and was acquitted. The unavoidable delays at a later period in getting his ships ready for sea gave another chance for his enemies to complain; and neglecting a citation to appear at Philadelphia, because no specific charges were made against him, and on account of his general disgust at the conduct of his opponents, he was dismissed the service, Jan. 2, 1777. He resided near Providence, and exerted during a long life a great political influence in Rhode Island, being often elected to the general assembly of that state.

HOPKINS, JOHN HENRY, an American clergyman, Protestant Episcopal bishop of the diocese of Vermont, born in Dublin, Jan. 30, 1792. He came to America with his parents in 1800, and was educated chiefly by his mother. He was intended for the law, but after receiving a classical education he passed a year in a counting room in Philadelphia, assisted Wilson the ornithologist in the preparation of the plates to the first 4 volumes of his work, and about his 19th year embarked in the manufacture of iron in the western part of Pennsylvania. On May 8, 1816, he married a daughter of Caspar Otto Müller, a retired merchant, formerly of Hamburg, and subsequently of Baltimore. The iron business was prostrated by the peace of 1815, and in Oct. 1817, he quitted it bankrupt in property, and after 6 months' study was admitted to the bar in Pittsburg; but in 1823 he left the bar for the ministry. From the time of his ordination as priest in May, 1824, he was rector of Trinity church, Pittsburg. A new building being needed, he became its architect, studying Gothic architecture for the purpose. In 1826 he was sent as clerical deputy to the first general convention after his ordination, and again in 1829, taking in both a prominent part in the debates. In the diocesan convention of 1827 he was a prominent candidate for the office of assistant bishop of Pennsylvania, the members being equally divided between him and Dr. H. U. Onderdonk, and Mr. Hopkins's own vote securing the election of the latter. In 1831 Mr. Hopkins accepted a call to Trinity church, Boston, as assistant minister on the Green foundation. A theological seminary was at the same time established in the diocese of Massachusetts, in which he became professor of systematic divinity. In the spring of 1832 he was elected the first bishop of the separate diocese of Vermont, and was consecrated in New York, Oct. 31, by Bishop White. He immediately proceeded to his diocese, accepting at the same time the rectorship of St. Paul's church, Burlington. He soon began a boys' school, which enabled him to give remunerative employment to a large number of candidates for orders. In erecting the needed buildings for the accommodation of this growing establishment, he became involved to a degree which resulted in the sacrifice of his property,

and an amount of debt which it was not in his power to cancel for many years. He resigned his rectorship in 1856, in order that he might devote himself more unreservedly to the work of the diocese, and the building up at Burlington of the "Vermont Episcopal Institute." Bishop Hopkins has been a diligent writer, and beside a number of pamphlets, sermons, and addresses, has published: "Christianity Vindicated, in a Series of Seven Discourses on the External Evidences of the New Testament" (Burlington, 1833); "The Primitive Creed Examined and Explained" (1834); "The Primitive Church compared with the Protestant Episcopal Church of the Present Day" (1835); "Essay on Gothic Architecture" (1836); "The Church of Rome in her Primitive Purity, compared with the Church of Rome at the Present Day" (1837); "Twelve Canzonets," words and music (New York, 1839); "The Novelities which Disturb our Peace" (Philadelphia, 1844); "Causes, Principles, and Results of the British Reformation" (Philadelphia, 1844); "History of the Confessional" (New York, 1850); "A Refutation of Milner's 'End of Controversy,' in a Series of Letters" (2 vols., 1854); "The American Citizen, his Rights and Duties" (1857).

HOPKINS, LEMUEL, an American physician, born in Waterbury, Conn., June 19, 1750, died in Hartford, April 14, 1801. He practised medicine at Litchfield from 1776 to 1784, when he removed to Hartford, where he sustained a high reputation, and had an extensive practice till his death. He was singular in his appearance, manners, and opinions; a man of talents and learning, and also a poet; in his early days an admirer of the French infidel philosophers, but in his later years a diligent student of the Bible. He was associated with Trumbull, Barlow, Alsop, Theodore Dwight, and others (called the "Hartford wits"), in the "Anarchiad," the "Echo," "Political Greenhouse," the "Guillotine," and similar satirical compositions; and he is said to have written for Barlow the beautiful and well known version of the 137th psalm beginning, "Along the banks where Babel's current flows."

HOPKINS, MARK, D.D., an American clergyman and author, born in Stockbridge, Mass., Feb. 4, 1802. He is a grandson of Mark Hopkins, who was an officer in the war of the revolution and subsequently a lawyer. He was graduated at Williams college, Mass., in 1824. Having filled a tutorship in the college for two years, he received in 1828 the degree of M.D., and in the same year commenced the practice of medicine in New York. In 1830 he was recalled to Williams college to fill the chair of moral philosophy and rhetoric, and in 1836 he succeeded Dr. Griffin as president of the college, a position which he still holds. He is also pastor of the college church. In addition to his labors as an instructor, he has lectured before the Lowell institute of Boston, the Smithsonian institution, and various scientific and literary associations. Presiding over a college which has

been called the cradle of foreign missions, he has also taken an active part in the deliberations of the American board of commissioners for foreign missions, of which since 1857 he has been president. He is the author of "Lectures on the Evidences of Christianity, before the Lowell Institute, delivered in Jan. 1844" (8vo., Boston, 1846); "Miscellaneous Essays and Discourses" (8vo., 1847); and of a number of occasional sermons and addresses published separately, including an address before the society for the promotion of collegiate education in the West, a discourse on Amos Lawrence, a benefactor of Williams college, one on the dedication of the college chapel, &c. Under his supervision Williams college has greatly increased her resources and the number of her students.

HOPKINS, SAMUEL, D.D., an American divine, from whom the Hopkinsians, so called, derive their name, born in Waterbury, Conn., Sept. 17, 1721, died in Newport, R. I., Dec. 20, 1803. Till about his 15th year he was occupied chiefly in agricultural labor, when he entered Yale college, where he was graduated in 1741, soon after which he went to Northampton to study divinity with Jonathan Edwards. In 1743 he was ordained pastor of the church in Housatonic (now Great Barrington), Mass., where he remained till 1769, when he was dismissed, and soon after began preaching in Newport, R. I. After he had been here some time, a meeting was called, and it was voted not to invite him to settle among them, as many were dissatisfied with his theological sentiments. He accordingly preached to them a farewell discourse, which was so touching and impressive that the vote was immediately and almost unanimously reversed, and he was settled as their pastor in 1770. When the British took possession of Newport in 1776, he was obliged to leave the place. Till 1780 he preached in various places; when, Newport being evacuated, he returned to his parish, which was so much reduced and impoverished that for the remainder of his life Dr. Hopkins was dependent for his maintenance upon weekly contributions and the voluntary aid of a few friends. In 1799 he was attacked with paralysis, from which he never entirely recovered, though his mental powers were uninjured, and he was afterward able to preach occasionally. "He had many qualities," says Dr. Channing, "fitting him for a reformer—great singleness of purpose, invincible patience of research, sagacity to detect and courage to oppose errors, a thirst for consistency of views, and resolution to carry out his principles to their legitimate consequences." By sermons and his famous "dialogues," by letters to public men, and newspaper essays, he stirred up an organized and political action against slavery, so that in 1774 a law was passed forbidding the importation of negroes into the colony, and in 1784 it was declared by the legislature that all children of slaves born after the following March should be free. He also formed a plan for evangelizing Africa, and colonizing it with free ne-

groes from America, as early as 1773. Beside his numerous sermons, addresses, and pamphlets, he published a life of President Edwards, and lives of Susannah Anthony and Mrs. Osborn, and left behind him sketches of his own life. His "System of Theology," however, is his great work, which, in connection with his other theological writings, must be fully understood by every one who would rightly appreciate New England either in its progress or its present condition. Of its author Dr. Channing writes that "he must always fill an important place in our ecclesiastical history." The entire works of Dr. Hopkins were published by Dr. West in 1805, and again, with a memoir of his life and character by E. A. Park, D.D., by the doctrinal tract and book society (3 vols., Boston, 1852). Dr. Hopkins is the hero of Mrs. H. B. Stowe's "Minister's Wooing."

HOPKINS, STEPHEN, an American statesman, one of the signers of the declaration of independence, born in Scituate, R. I., March 7, 1707, died in Providence, July 13, 1785. In early life he took up his residence in Providence, and in 1733 was elected a member of the general assembly, and in 1739 chief justice of the court of common pleas. In 1755 he was elected governor of the state, and remained in office, with the exception of 4 years, until 1768. He early sided with the colonies against the mother country. In 1754 he was appointed a member of the board of commissioners which assembled at Albany, N. Y., to concert and digest a plan of union for the colonies. Benjamin Franklin, Sir William Johnson, and Roger Wolcott were among the members of the board. In 1765 he was elected chairman of a committee appointed at a special town meeting held in Providence to draft instructions to the general assembly on the stamp act. He was not governor that year. The resolutions reported were the same that Patrick Henry introduced into the house of burgesses of Virginia, with an additional one stating that "we are not bound to yield obedience to any law or ordinance designed to impose any internal taxation whatever upon us, other than the laws and ordinances of Rhode Island." These resolves passed in the assembly, including the above, which had been rejected in Virginia. In Aug. 1774, he was, with Samuel Ward, elected to represent the state in the general congress held at Philadelphia, and was also chosen in 1775 and 1776. He used his influence in this relation in favor of decisive measures. In the "Sketches of Scituate," by the Rev. C. C. Beaman, published in the "Providence Journal," is an extended notice of Hopkins and his family. Speaking of the first congress, that writer says: "Some of the members being desirous of further delay, in the hope of reconciliation, Mr. Hopkins observed that the time had come when the strongest arm and the longest sword must decide the contest, and those members who were not prepared for action had better go home." At that time, entering upon his 70th year, he had the fire of youth in his zeal for the emanci-

pation of his country. His signature to the declaration of independence indicates a trembling hand, which was owing to a nervous affection. On the naval committee he was placed next after John Hancock, the chairman, and greatly assisted in the formation of a navy. John Adams, who was associated with him on this committee, says: "The pleasantest part of my labors for the 4 years I spent in congress, from 1774 to 1778, was in this naval committee. Mr. Leo and Mr. Gadsden were sensible men and very cheerful, but Gov. Hopkins of Rhode Island, above 70 years of age, kept us all alive. Upon business his experience and judgment were very useful. But when the business of the evening was over, he kept us in conversation till 11, and sometimes till 12 o'clock. His custom was to drink nothing all day, until 8 in the evening, and then his beverage was Jamaica spirits and water. It gave him wit, humor, anecdotes, science, and learning. He had read Greek, Roman, and British history, and was familiar with English poetry, particularly Pope, Thomson, and Milton; and the flow of his soul made all his reading our own, and seemed to bring in recollection in all of us all we had ever read. I could neither eat nor drink in those days; the other gentlemen were very temperate. Hopkins never drank to excess, but all he drank was immediately not only converted into wit, sense, knowledge, and good humor, but inspired us with similar qualities." For 50 years Gov. Hopkins filled some public station; he was for many years chancellor of Brown university. In 1765 he commenced a "History of the Planting and Growth of Providence," published in the "Providence Gazette." In the same year he wrote and published, by order of the general assembly of Rhode Island, a work entitled "The Rights of the Colonies Examined," which was reprinted in London. His native state has caused a monument to be erected over his grave.

HOPKINSON, FRANCIS, an American writer and statesman, one of the signers of the declaration of independence, born in Philadelphia in 1737, died May 9, 1791. He was the son of an English gentleman, Thomas Hopkinson, who died when his son was 14 years of age. He was graduated at the college of Philadelphia (now the university of Pennsylvania), having been the first student who entered that institution at its opening, and he afterward studied law. He was secretary in a conference held on the Lehigh between the government of Pennsylvania and several Indian tribes in 1761, an event celebrated in one of his poems. In 1766 he went to England, where he remained two years. After returning to America he settled at Bordentown, N. J., where he married Miss Ann Borden of the family from which the place derives its name. In 1776 he was sent from New Jersey as one of her representatives in congress. During the revolution he distinguished himself by satirical and political writings, which attained such popularity that it has been truly said that few pens effected more than Hopkinson's in

educating the American people for political independence. He also exercised his raillery both in prose and verse at the expense of most of the social follies of his time. In 1779 he was made judge of the admiralty of Pennsylvania, which office he held for 10 years, until the organization of the federal government, when it expired. As soon, however, as Gen. Washington entered upon his duties as president of the United States, he addressed to Hopkinson a highly complimentary letter enclosing a commission as U. S. district judge for Pennsylvania. He was a man of varied accomplishments, being not only familiar with science as it then existed, but skilled in painting and music, composing highly popular airs for his own songs. Of his political writings the most prominent were: "The Pretty Story" (Philadelphia, 1774); "The Prophecy" (1776); "The Political Catechism" (1777). The best known of his poems are: "The Battle of the Kegs," a humorous ballad, and "The New Roof, a Song for Federal Mechanics." The "Miscellaneous Essays and Occasional Writings of Francis Hopkinson" were published by Dobson (Philadelphia, 1792). —JOSEPH, LL.D., an American jurist and poet, son of the preceding, born in Philadelphia, Nov. 12, 1770, died there, Jan. 15, 1842. He was educated at the university of Pennsylvania, studied law, and began to practise at Easton, Penn., in 1791, whence he returned to Philadelphia. In the celebrated case of Dr. Rush against William Cobbett in 1799, he was leading counsel for the plaintiff, as also in the insurgent trials before Judge Chase in 1800. Subsequently, when Judge Chase was impeached before the U. S. senate, he chose Mr. Hopkinson to defend him. From 1815 to 1819 he was a member of the house of representatives from Philadelphia. He opposed the recharter of the U. S. bank, and made a noted speech on the Seminole war. At the close of 1819 he retired from congress, declining a reelection. Having gone to Bordentown to reside, he was elected to the legislature of New Jersey. In 1823 he returned to Philadelphia to resume the practice of his profession. In 1828 he was appointed judge of the U. S. court for the eastern district of Pennsylvania, an office which had been filled by his father under Washington. In 1837 he was chairman of the judiciary committee of the convention to revise the constitution of Pennsylvania. He is however best known as the author of the national song "Hail Columbia," written in 1798 for the benefit of an actor named Fox, and after an air entitled "The President's March," composed in 1789 by a German named Feyles on the occasion of Gen. Washington's first visit to a theatre in New York. Hopkinson was for many years a confidential friend of Joseph Bonaparte, then residing at Bordentown, and during his absence always managed his affairs.

HOPKINSVILLE, a township and the capital of Christian co., Ky., on Little river, and on the Edgefield and Kentucky railroad, 70 m. from Nashville, and 168 m. S. W. from Frank-

fort; pop. in 1853, about 3,500. It is well built and laid out, contains 6 or 8 churches, 5 newspaper offices, a bank, an academy, 3 seminaries for young ladies, manufactories of tobacco, carriages, &c., and a botanic garden. It is the seat of one of the state lunatic asylums, a handsome building 368 feet long, with rooms for 300 patients; it cost \$180,000. Hopkinsville was laid out in 1799, and incorporated in 1806.

HOPPIN, AUGUSTUS, an American artist, born in Providence, R. I., July 13, 1828. He was graduated at Brown university, and was subsequently admitted to the bar of Rhode Island; but of late years he has devoted himself exclusively to drawing upon wood. He has illustrated Butler's poem of "Nothing to Wear," the "Autocrat of the Breakfast Table," and a variety of other periodicals.—THOMAS F., brother of the preceding, born in Providence, R. I., Aug. 1816, studied painting with Paul Delaroche in 1837-'8, and subsequently designed the figures on the great window of Trinity church in New York. He has produced a spirited model of a dog, which has been cast in bronze, and numerous etchings in outline and designs in wood.

HOR., in biblical geography, a mountain near the southern boundary of eastern Palestine, upon which Aaron, the brother of Moses, died. It is now generally identified with the Jebel Haroun (Mount Aaron) of the Arabs, in Arabia Petraea, the most conspicuous mountain in the range of Seir.

HORACE (QUINTUS HORATIUS FLACCUS), a Roman poet, born in Venusia, Apulia, Dec. 8, 65 B. C., died Nov. 27, 8 B. C. His father was a freedman, collector, and proprietor of a farm, and though of servile origin determined to devote his time and fortune to the education of his son. He declined to send him to the common school of Venusia, but took him to Rome, where he was educated as the son of a knight or senator. One of his teachers, the flogging Orbilius (*plagosum Orbilius*), the poet has immortalized. He studied the Greek and Latin poets, especially Homer and Livius Andromachus, and went through the usual course of rhetorical instructions, his father attending him in person to all his masters, and guarding him from temptations. From Rome he was sent in his 18th year to Athens to continue his studies, and, though he chiefly attached himself to the philosophical tenets of the Academy, he heard also Cratippus the Peripatetic and Philodemus the Epicurean. There, too, he read Homer again, the masterpieces of Grecian tragedy and comedy, and especially the Greek lyric poets. When Brutus arrived in Athens on his way to Macedonia after the death of Cæsar, Horace enthusiastically joined him with other Roman students, and notwithstanding his youth and inexperience was advanced to the rank of a military tribune and the command of a legion in the republican army. To his share in the battle of Philippi, the loss of his shield, and his hasty flight, he playfully alludes (*Carm.* ii. 719), intimating that he knew when he was beaten, and ascribing his

escape to Mercury, the god of poets. He returned to Rome with no prospects, his paternal estate having been confiscated, but was enabled to buy a clerkship in the quaestor's office, which furnished scanty emolument. "Bold poverty," he says, "impelled me to write verses." His efforts soon won the attention of Virgil and Varius, who introduced him to Mæcenas. The latter dismissed him with few words and no promises, and took no further notice of him for 9 months, after which their friendship rapidly ripened into intimacy. In the following year (37) he accompanied his patron on the journey to Brundisium which is the subject of *Sat.* i. 5. He soon after received from Mæcenas the gift of his Sabine farm, which he has often described, and which secured him the means of support and enjoyment for the rest of his life. His constant intercourse with Mæcenas introduced him to the society of other distinguished men, as Ælius Lamia, Agrippa, Pollio, and Tibullus, and won the notice of Augustus himself, who was ambitious of being celebrated by the poet, but whose offers of advancement the latter seems to have declined, though he expresses in his odes the prevailing admiration for "the tutelary guardian of peace, civilization, and progress." His friendship with Mæcenas was unbroken till the death of the latter, who in his last words commended him to the emperor: *Horatii Flacci, ut mei, este memor*. Horace died a few weeks later, so suddenly that having no time to make his will he appointed Augustus his executor and heir, and he was buried on the slope of the Esquiline hill. His poems contain many particulars as to his person, habits, tastes, and temperament. He was of short stature, with dark hair which early turned gray, and dark eyes, and in advanced life was very corpulent. He was never married. He appears to have been of a singularly contented and happy nature, adopting a practical, if not speculative, Epicureanism, a lover of choice wines and good society, but generally simple and frugal in his habits. His odes are exquisitely finished, and are marked by a faultless taste and a mastery of metre and of language, by keen observation and a joyous amenity. His satires are sketches of the life and manners of the Romans in the reign of Augustus, and present a striking contrast to the more grave and severe productions of Juvenal, which is explained by the difference in the personal character and in the times of the two poets. His epistles are the most perfect of his poems, fully exhibiting his terseness and elegance of style, and abounding in wise thoughts and just sentiments on manners and society, which have made Horace the favorite companion not only of scholars but of men of the world, the most read, best remembered, and most frequently quoted of all the writers of antiquity.—The best editions of Horace are those of Lambinus (1561), Torrentius (Antwerp, 1608), Heinsius (1612), Bentley (Cambridge, 1711), Burmann (1713), Sanadon (1728), Döring (Leipsic, 1803), Braunhard (Leipsic, 1833),

and Orellius (Zürich, 1837). Translations of his works have been made into nearly all European languages, but there is no English version of his complete writings which is much esteemed. The free metrical translations of various of the odes and satires, however, by Dryden, Pope, Swift, and others, are excellent. A collection of translations by many eminent hands, including Ben Jonson, Cowley, Milton, Dryden, Addison, Pope, Chatterton, Byron, &c., was published by Valpy as an appendix to the translation of the works of Horace by the Rev. Philip Francis (2 vols. 12mo., London, 1831). The odes have also been rendered into English lyric verse by Lord Ravensworth (London, 1858).

HORATHI, in Roman legendary history, three brothers who fought with three Curiatii of Alba to decide whether Rome or Alba should have supremacy. The Curiatii were all wounded, and two of the Horatii were killed and one unhurt, when the latter pretended to fly, but, turning suddenly, vanquished his wounded opponents separately. His sister Horatia was betrothed to one of the Curiatii, and as he returned in triumph bearing the mantle of her lover she received him with wailing and reproaches, whereupon he stabbed her to the heart. He was absolved from punishment, except that he was led with veiled head beneath a yoke, *tigillum sororium*, "the sister's gibbet."

HOREB. See **SINAI**.

HOREHOUND (*marrubium vulgare*, Linn.), a plant of the natural order *labiata* or *lamiales*, of European derivation, now common by our roadsides. Its stems, which are annual, springing from a perennial fibrous root, grow to the height of 12 or 18 inches, are quadrangular, covered with down, and bear in July and August white flowers in crowded axillary whorls. The tubular calyx contains 4 seeds at its base. The herb, like many others of the same order, is remarkable for its pleasant odor and tonic properties, so that it is a favorite domestic medicine, being used in the form of a decoction, in a sirup, and in candy, especially for colds and affections of the lungs. It has a bitter taste, and this is imparted to water and to alcohol.

HORIZON (Gr. *ὁρίζων*, from *ὁρίζω*, to bound or define), the line that apparently separates earth and sky. In astronomy, the apparent horizon is a plane tangent to the earth at the observer, and the real horizon is a plane through the centre of the earth parallel to the apparent horizon. (See **ARTIFICIAL HORIZON**.)

HORMAYR, JOSEPH VON, baron, a Tyrolese historian and patriot, born in Innsbruck, Jan. 20, 1781, died in Munich, Nov. 5, 1848. He was the scion of a patrician family of high standing in the Tyrol since the 13th century. His father (1705-'85) was one of the most eminent jurists and publicists of his day, and the first to protest against the use of torture to extort confession in the Austrian dominions. Young Hormayr studied jurisprudence, but displayed a precocious taste for historic studies, and wrote in his 13th year a history of the dukes of Meran. He entered the

Austrian military service in 1797, and served in the Tyrolese militia. He held an office in the ministry of foreign affairs at Vienna from 1801 to 1803, when he became director of the archives. One of the most strenuous opponents of Napoleon, and anxious to foster the loyal disposition of the Tyrolese toward the house of Hapsburg, he became, under the auspices of the Austrian government, the chief promoter of the insurrection in the Tyrol, and more particularly in the Vorarlberg, against French and Bavarian influence. After the armistice concluded at Znaim in July, 1809, he returned to Vienna, where he was made an imperial councillor. In the literary labors to which he now devoted himself, he was interrupted in 1813 by a renewed attempt on his part to revolutionize the Tyrol; but he was now imprisoned by the Austrian government, which was impelled to this measure by fear of giving umbrage to Bavaria, then on the point of joining the alliance against Napoleon. He was released in 1815, and appointed imperial historiographer. He lived in retirement in Brünn from 1820 to 1828, when he became a member of the Bavarian cabinet, as chamberlain and councillor in the department of foreign affairs. From 1832 to 1839 he was Bavarian ambassador at Hanover, and to the Hanse towns from 1839 to 1846, when he was recalled to Munich to assume the direction of the national archives. One of his most interesting works is *Lebens-Bilder aus dem Befreiungskriege* (3d part, with additions, Jena, 1844). He also wrote *Geschichte der gefürsteten Grafschaft Tirol* (2 vols., Tübingen, 1806-'8); *Allgemeine Geschichte der neuesten Zeit* (3 vols., Vienna, 1817-'19; 2d ed., 1831); and *Das Land Tirol und der Tirolerkrieg 1809* (2 vols., Leipsic, 1845).

HORN, a modification of the epidermis, presenting the same structure, whether in the nails of man, the claws of the carnivora and birds, the hoofs and horns of ruminants, the spines of the porcupine and hedgehog, the plates of the armadillo, the whalebone of cetaceans, the quills of birds, or the shell of tortoises. Horn is composed of coagulated albumen, gelatine, and a small portion of phosphate of lime; the horns of the stag and other deciduous antlers are true bone, belonging to the dermal or exo-skeleton, and shed by a process of absorption at the root analogous to that by which dead bone is cast off in necrosis. Its structure is a modification of epidemic cells, harder dried, more firmly adherent, and in which the nucleus is generally invisible; the cells are arranged in regular layers, each indicating a period of growth, and are marked by perceptible striæ. The above named horny tissues are generally attached at the base to the dermis, and are removed with the skin; they are constantly growing and wearing away, and are liable to various deformities from accidental circumstances; and the younger cells may contain pigment matter. Sections of horn under the microscope are very beautiful when seen by polarized light. The horn of the rhinoceros, as already stated in the article

HAIR, in its essential character is a mere bundle of hairs; the substance erroneously called whalebone, formed by the lining membrane of the whale's mouth, has no connection with the bony skeleton, but is a horny tissue, composed of fibres whose central portion, like the medullary substance of hair, contains easily recognizable cells. In the ox, sheep, and the hollow-horned ruminants, there is a central core of bone upon which the horns are moulded.—Horn in its many varieties is adapted to numerous useful purposes; and it is an article of trade, horns and hoofs of cattle being largely exported from South America, southern Africa, and Russia. The horns of the buffalo are brought from the East Indies. From the most remote periods horns have been applied to various uses. The Israelites and Egyptians made of them musical instruments. The Latin name *cornu* was also the name for trumpet, and the English name retains the same application, even if the instrument be made of brass or silver. The form of the horn adapted it for a drinking utensil, and the word is still sometimes employed in a manner to suggest this application. Mr. Aikin states ("Transactions of the Society of Arts," vol. lii.) that horn was sometimes employed for suits of scale armor, and also for bows, as is still practised in India and China. It also served instead of glass for windows. The methods now in use for working horn are described in Holtzapffel's "Mechanical Manipulations." The bony horns of the deer, being cellular within, are used only in their natural forms, so as not to expose their internal structure. They are sawn and filed into the shapes required for handles of knives, &c., and are sometimes partially straightened by mechanical force after being softened by immersion in hot water. The exposed ends are usually covered with metallic caps. The horns particularly adapted for being converted into useful shapes are those of the ox, antelope, goat, and sheep kinds, which by reason of their laminated structure are readily separated into layers. They contain just enough gelatine in their composition to admit of their being softened by the application of less heat than that of melted lead. The material may then be cut open with knives or shears, flattened into plates, divided into leaves, and struck between dies like metal. Surfaces also, when free from grease, may be made to adhere permanently, by being heated, moistened, and pressed together, the gelatine acting as a natural solder. The first step in the treatment of horn is to separate the bony core. For this purpose it is macerated several weeks in water, which causes the lining membrane to putrefy, so that when a horn is taken out and rapped upon a block of wood, the core falls out. This is burned, to make the bone earth used for cupels in assaying. The solid tip of the horn is sawn off, and is reserved for handles for knives, umbrellas, &c., and for buttons. The remainder, either cut into short lengths or entire, is softened by immersion for half an hour in boiling water, and then by heat-

ing in the flame of a fire nearly to the temperature of melted lead. The pieces, unless intended for horn cups or similar objects, are then slit open with a sharp-pointed knife, and spread out flat. A solid block of iron with a conical hole, and an iron plug to fit it, are also used to open horns without endangering the scorching of them. Both being heated to the right temperature, the horn slit with a knife is inserted in the hole, and the plug driven into the horn with a mallet. In a minute it is sufficiently softened to be easily opened. The pieces, now called flats, are laid between boards or between heated iron plates, and subjected to pressure. The amount of this for general purposes, as for combs, is moderate, for much pressure tends to make the horn split into thin laminae. But if thin plates are to be made, such as are used for lanterns, a heavy pressure is required, and if the horn is light-colored this increases its transparency. Such plates, when separated, are scraped with a wiry-edged knife till sufficiently thin, and are then rubbed with a woollen cloth dipped in charcoal dust and water, then with rotten stone, and lastly polished with horn shavings. The horn may be dyed, if desired, by boiling it in infusions of various colored ingredients. A rich red brown color is given to it by a mixture of quicklime, pearlsh, and litharge which has been boiled half an hour in water with the addition of a little pulverized dragon's blood. The compound is applied hot wherever the color is wanted, and a deeper tinge is given by renewing the application. Horn in its natural color is less brittle than that which has been thus treated. The following is a recently devised method of rendering horn soft and elastic like whalebone. The flats are immersed for several days in a bath of water 100 parts, glycerine 5 parts; then in a bath of 3 quarts of nitric acid, 2 quarts of pyroligneous acid, 12½ lbs. of tannin, 5 lbs. bitartrate of potash, and 5 lbs. of sulphate of zinc with 25 gallons of water. The flats intended for knife handles, buttons, &c., are cut with a saw into convenient shapes, and these when heated are worked down with knives or spoke shaves as if they were wood. When sufficiently reduced, the pieces are pressed into moulds, formed of two dies, which with the horn are dipped for a few minutes in boiling water, then clamped tightly together, and kept in this state about 20 minutes. Horn may also be softened so as to be fit for moulding by steeping it for a week in caustic alkaline liquor. The short lengths of horn not split open may be made into drinking cups by fixing the large end to a lathe, and turning the cylindrical piece into shape inside and out, forming a groove or chime for the bottom piece, which when turned into shape is dropped into the horn. This is first expanded by heat, and by cooling it fixes the bottom water-tight.

HORN, a musical wind instrument, originally formed, as its name denotes, from the horn of an animal. The name includes a large family

of instruments, many of which have fallen into disuse. The hunting horn, a brass or copper tube gradually expanding into a bell-shaped mouth, and bent into a semicircle, was long the chief form extant. Within a century, however, the instrument has been so greatly improved as to rank at present among the first in the orchestra. The French horn consists of a metallic tube, about 10 feet in length, bent into several circular folds, and gradually widening toward the end whence the sound issues, called by the French the *parillon*. In common with all horns, it is blown through a cup-shaped mouthpiece of brass or silver, and the sounds are regulated by the motion of the player's lips, the pressure of his breath, and by inserting the hand or a pasteboard cone in the *parillon*. Horns are generally used in pairs, and are blown in different manners, the first horn in the orchestra generally making use of 2 octaves, and the second of 3 octaves. For the purpose of adapting them to different keys, shifting pieces of various lengths, called crooks or shanks, are added to the lower part of the tube. Music for the horn is always written in the key of C, an octave higher than it is played. In order to procure clear and distinct sounds of all the notes, the piston was added to the horn by Stöelzel; but the pistoned horn, or *cornet à piston*, as it is commonly called, is inferior to the parent instrument in purity of tone. Within 20 years great improvements have been made in the instrument by C. J. Sax of Paris, whose Sax horn, modelled after the antique, affords a far greater volume of sound than the old instrument. The basset horn and the English horn are not properly horns, the former belonging to the clarionets and the latter to the hautboys. The Russian horn is a straight brass tube, expanding toward the lower end, and of various dimensions. (See BUGLE HORN.)

HORN, CAPE. See CAPE HORN.

HORN, or HOORNE, PHILIP II. DE MONTMORENCY-NIVELLE, count of a Flemish soldier and statesman, born in 1522, executed at Brussels, June 5, 1568. His father was descended from the noble French family of Montmorency, and on his mother's side he was related to Lamoral Egmont, with whose fate his own was destined to be unhappily linked. His mother, becoming a widow when he was about 8 years of age, was married again to John, count of Horn, one of the wealthiest nobles of the Netherlands, who, having no children of his own, left his estates to his wife's children, on the condition that they should assume his name. Philip count of Horn thus at the outset of his career became one of the most powerful of his order, and subsequently received from the emperor Charles V. and from Philip II. several important trusts and distinctions, including the decoration of the golden fleece and the appointments of governor of Geldern and Zutphen, admiral of the Flemish fleet, and councillor of state. He fought with reputation in the battles of St. Quentin and Gravelines, and in 1559 accompa-

nied Philip II. to Spain, where during a residence of two years he is supposed to have received information of the designs of the Spanish court against the Netherlands, and to have communicated them to the prince of Orange. Returning to the Netherlands, he joined Orange and Egmont in resisting the aggressive policy of Philip, and in urging him to recall Cardinal Granvelle; and with them he retired from the state councils until the departure of the obnoxious minister. Like Egmont and William of Orange, he also declined to sign the compromise of Breda against the introduction of the Spanish inquisition into the Netherlands, in which the greater part of the lesser Flemish nobility were interested; but his accidental presence with his friends at a banquet at which the signers of the compromise first took the name of *gueux* or "beggars" (April, 1566), proved afterward a serious charge against him. After the excesses committed by the iconoclasts in the same year, he was instrumental in preventing a general massacre of Catholics at Tournay; but his permission to Protestants to worship in clothiers' hall, within the city, subjected him to a severe reprimand from the regent Margaret, in consequence of which he offered to resign all his offices, and wrote a blunt letter to the king complaining of the policy pursued by Margaret, and protesting that he would no longer treat of affairs of business with ladies. His large possessions had meanwhile been very considerably reduced by disbursements made in the king's service, for which he had received no recompense (his expenditure for this purpose having amounted, it is said, to 400,000 florins); and he retired to his estates, discontented and smarting under many injuries real or fancied, but still loyal to the crown and indisposed to accept the doctrine of resistance already broached by the prince of Orange. He refused at first to take the new test oath exacted by the regent; but after the retirement of the prince to Germany he made her an offer of his services, and agreed to take the oath. This new proof of loyalty was of no avail with Philip, who had long decided upon the death of Horn; and upon the arrival of Alva in Brussels, both Egmont and Horn were enticed to that city and there arrested, Sept. 9, 1567, on a charge of treason and other high offences. (See EGMONT.) His wife and mother made ceaseless efforts to obtain for him a fair trial, and, as in Egmont's case, appeals for royal clemency in his behalf were made to Philip by potentates in all parts of Europe. He was executed after Egmont, and met his fate with perfect composure, although, when his sentence was first made known to him, he indignantly protested against its injustice, exclaiming that it was a poor requital for 28 years of faithful services to his sovereign. He was a man of imposing presence, brave, honest, and straightforward; but he was impatient and discontented, and had not the military genius nor the personal accomplishments and graces of his companion in misfortune.

HORNBEAM, the common name of a genus of trees (*carpinus*) whose wood is of a horny texture, and whose general appearance is that of the beech, the leaves in particular looking like those of the beech or birch. The hornbeams are included in the order *cupulifera*, to which likewise belong the oaks. The common hornbeam (*C. betulus*, Linn.) is indigenous to various parts of Europe, and, according to Sir James Edward Smith, is generally a rigid tree of humble growth. Miller, a writer on gardening in 1735, says that when growing under favorable circumstances it will reach to the height of 60 or 70 feet; but that it is very seldom allowed to become a timber tree, being cut into what are called pollards, and is so patient under the knife as to be good for making hedges. The tree seems to have been well known to the ancients, and was called by the Greeks *ζυγία* or yoke tree, from the use made of its wood. Its comparatively slow growth has displaced it as a hedge plant, for which beech is now preferred. It seems to be liable to many kinds of parasites in the forms of fungi and of insect larvæ. The oriental hornbeam (*C. orientalis*, De Lamarck) is only a dwarf tree or shrub, rising to the height of 12 feet, and found wild in Asia Minor and the Levant. Its leaves are much smaller, and the branches grow closer together, than those of the English hornbeam, so that it is better fitted for hedges. There is a hornbeam on the mountains of Nepal, and, according to Royle, also at Mussoree, thriving at the altitude of 6,500 feet above the level of the sea. Its wood is considered durable and valuable for building purposes. The beech-like hornbeam (*C. faginea*) is nearly allied to the *C. orientalis*, and a native of the same country. In the United States the hornbeam is represented in a small tree from 10 to 12 feet high, growing along streams, its trunk covered with ridges, and its wood white and very hard. It is the *C. Americana* of Michaux. Its leaves are ovate-oblong, doubly serrate, nearly smooth; the barren flowers are borne in catkins on the sides of the branches, and appear before the leaves expand; the fertile flowers come out of the same bud with the leaves at the ends of the branches. When mature, the fruit heads consist of a series of alternate pairs of arrow-shaped leaflets cohering at the base, and each forming a cup, which encloses an egg-shaped, 8-sided nut. The American hornbeam, where it has had ample space in which to grow, is a low tree with a broad, round, crowded, leafy head, the lower branches bending nearly to the ground on every side. It is thus a tree of some claim to beauty, and it forms an interesting object in the forest. Easily cultivated, it is worthy of regard in arboriculture. Its geographical range is from New England to Georgia.

HORNBILL (*buceros*, Linn.), a genus of conirostral birds of Africa and the East Indies, of the family *bucerotida*. The principal genus *buceros* is characterized by an enormous bill, long, broad, curved, surmounted by helmet-like prom-

inences of various sizes and shapes, with compressed sides and acute tip; the lateral margins are more or less jagged and serrated in the adult; the nostrils are basal, lateral, and small; the wings are rather short, with the 3d quills nearly as long as the 4th and 5th, which are equal and longest; tail long and broad, more or less graduated; tarsi short, robust, covered in front by large transverse scales; toes broad and long, and united at the base so as to form a kind of sole; the hind toe large and flat, giving a firm support in their leaping mode of progression; claws long, curved, and sharp. The face and throat are more or less naked, sometimes with a gular pouch; above the eyes are a few bristly hairs, like lashes; the tongue is small and cartilaginous. Nearly 40 species are described, in which the bill, always large, has a great diversity of form, varying in its protuberances according to age; bulky though it be, it is of a light and cellular structure, and by no means the formidable weapon its size would indicate; its awkward shape and slight mechanical support render it difficult for the bird to manage except for seizing objects requiring slight force; its thin edges, broken by use, undergo a constant process of repair. Most of the species are of large size; they are observed singly or in parties, in the dense jungles and woods, perched on the highest branches, especially on decayed limbs near rivers; they feed upon pulpy fruits, small quadrupeds, birds, reptiles, and insects, which they crush with the bill, and, after tossing them into the air, swallow whole; when hard pressed they will not refuse carrion. The flight is heavy and straight, generally at a considerable height, and accompanied by a remarkable noise; the cries are hoarse croaks or harsh screams; the nest is hollowed in a decayed tree, and the eggs are about 4. The largest species is the rhinoceros hornbill (*B. rhinoceros*, Linn.), nearly 4 feet long with an expanse of wings of about 3 feet; the bill is nearly a foot long, the upper mandible having a recurved prominence like a rhinoceros horn, giving the head the appearance of being top-heavy; the general color is black, the tail being tipped with dirty white; the bill is black at the base, reddish in the middle, and light yellow at the point. It is a stupid and cowardly bird, seldom showing any vivacity except when in search of food; it is found in India and its archipelago, and is common in collections of natural history; it is voracious, and in captivity is decidedly omnivorous. The red-billed hornbill (*B. erythrorhynchus*, Temm.), a native of Africa, like the rest of the genus, breeds in hollow trees; it occupies holes, according to Livingstone, in the mopane tree (*bauhinia*), a very hard wood; the female makes her nest in February, lining it with her own feathers, and lays 4 or 5 eggs, of the size of a pigeon's, and of a white color; she remains a close prisoner in the hole until the young are fully fledged, a period of 8 or 10 weeks; during this time the opening is plastered up with clay by the male, with the excep-

tion of a slit 3 or 4 inches long and about $\frac{1}{4}$ an inch wide, exactly fitting the shape of his beak, and through this he feeds the female and the young. While thus imprisoned she gets very fat, and is esteemed by the natives a dainty morsel; they often dig her out, letting alone the lean and overworked male. The female sometimes hatches out 2 young, and by the time these are fully fledged 2 others are just out of the egg; she then leaves the nest with the 2 oldest, and the hole is again plastered up, both parents attending to the wants of the remaining young through a narrow opening, until they too are able to come forth.

HORNBLLENDE (*amphibole* of Haüy), a mineral species placed by Dana in the augite section of the anhydrous silicates. Its composition is represented by the general formula, $4RO\ 3SiO_2$, in which RO may be either lime, magnesia, protoxide of iron, or manganese. In some varieties the silica is replaced by alumina. The application of the law of isomorphism brings together under the same species many minerals that were formerly regarded as distinct; and thus actinolite, tremolite, asbestus, and others, are now properly included in this species. In common use the name is limited, as it was formerly applied, only to the dark crystalline minerals, which are met with in long slender prisms, either scattered in quartz, granite, and other igneous and metamorphic rocks, or generally disseminated throughout their mass; constituting with feldspar alone greenstone and varieties of the trappean rocks and also hornblende slate; with feldspar and quartz, the rock syenite, or if mica too be present, syenitic granite. The crystals are also aggregated together to form rocks called hornblende or amphibole rocks, the texture of which is sometimes granular. The color of the mineral is usually black or dark green, owing to the presence of much iron; its hardness is 5-6; specific gravity, 3.1-3.4. It has close affinities with augite, and on cooling after fusion it has been found to assume the form and cleavage of this mineral. It appears to have been produced under conditions of fusion and cooling which cannot be imitated in the laboratory, the crystals obtained artificially being of the augite type.

HORNE, GEORGE, D.D., an English prelate and author, born in Otham, Kent, Nov. 1, 1780, died in Bath, Jan. 17, 1792. He studied theology, and in 1753 took orders, and soon became distinguished as a preacher. He became president of Magdalen college in 1768; chaplain to the king in 1771; vice-chancellor of the university of Oxford in 1776; dean of Canterbury in 1781; and bishop of Norwich in 1790. His writings, which are numerous and on various subjects, were collected and published in 1795, in 6 vols., with a memoir of his life, &c., by his chaplain, the Rev. William Jones. Sympathizing in the views of John Hutchinson, his first publication was an ironical attack on the philosophy of Newton in 1751, in which he draws a parallel between the heathen notions of Cicero's *Somni-*

um Scipionis and the Newtonian doctrines. This was followed by other similar works in the next 10 years, in which he attacked such men as Drs. Kennicott and Shuckford. He published several volumes of sermons; letters to Dr. Priestley; letters on infidelity; and a letter to Adam Smith on the life, death, and philosophy of David Hume. His great work, however, is his "Commentary on the Psalms" (2 vols. 4to., Oxford, 1776), on which he bestowed the labor of 20 years.

HORNE, RICHARD HENRY, an English author, born in London in 1803. Disappointed in the hope of securing a military appointment in the East India company's service, he entered the Mexican navy as a midshipman, and served until the conclusion of the war of independence. Subsequently he devoted himself to literature in London, and wrote "Cosmo de Medicis," "The Death of Marlowe," and "The Death Fetch," tragedies founded on Elizabethan models; followed by the "Adventures of a London Doll," "The Good-Natured Bear," and "An Exposition of the False Medium, and Barriers excluding Men of Genius from the Public" (8vo., 1838). Subsequently he produced another tragedy, "Gregory the Seventh" (1840), preceded by an essay on tragic influence which has been much commended; a "Life of Napoleon" (2 vols. 8vo., 1841); and in 1843, "Orion, an Epic Poem," the price of which was announced upon the title page to be one farthing. This sarcasm upon the public appreciation of modern epic poetry attracted attention to the work, and 3 large editions were soon sold at a farthing per copy. In the 4th edition the price was raised to a shilling, and in the 5th to half a crown, so that the speculation eventually proved a good one. The poem is perhaps his best literary production. It was succeeded by "A New Spirit of the Age" (2 vols. 8vo.), a series of criticisms on living English authors; "Spirit of Peers and People" (8vo.); "Ballads and Romances" (12mo., 1846); "Judas Iscariot, a Miracle Play, with Poems" (8vo., 1848); "The Poor Artist, or Seven Eyesights and One Object" (1850); and "The Dreamer and the Worker" (2 vols. 8vo., 1851). In 1852, in company with William Howitt and others, he left England to settle in Australia, and, after digging for some time with varied success, became consecutively a chief of mounted police and gold commissioner and territorial magistrate. His last work, "Australian Facts and Prospects," was published in the latter part of 1859. In addition to the works mentioned, he is the author of articles in various periodicals.

HORNE, THOMAS HARTWELL, D.D., an English author, born Oct. 20, 1780. He was educated at Christ's hospital, where he remained from 1789 to 1795, after which he became a clerk in a barrister's office, and devoted his leisure to solitary study. In his 19th year he published his "Brief View of the Necessity and Truth of the Christian Revelation." Applying himself with great diligence to the study of

sacred literature, he produced in 1818 his "Introduction to the Critical Study and Knowledge of the Holy Scriptures," in consideration of which he was admitted to holy orders without the usual preliminaries. He received the degree of B.D. from the university of Cambridge, and in 1833 was presented to the rectory of St. Edmund the King and St. Nicholas Acons, London, having previously been made a prebendary of St. Paul's. In this office he has found time to produce a great number of theological and bibliographical works. The most important of them is his "Introduction" (10th ed., 4 vols. in 5, London, 1856; also many editions in America), one of the most elaborate and highly esteemed critical works on the Scriptures. Among his other publications are: an "Introduction to the Study of Bibliography" (2 vols., 1814); an edition of the works of Hogarth (2 vols., 1821); "Manual for the Afflicted" (1832; 3d ed. 1842; reprinted in Boston, 1833); "Protestant Memorial" (1835; 10th ed. 1850); "Manual of Biblical Bibliography" (1839), which also formed part of the "Introduction" till the 10th edition of the latter; "Mariolatry, or Facts and Evidences demonstrating the Worship of the Virgin Mary by the Church of Rome" (1840; edition by S. F. Jarvis, D.D., Hartford, 1844); "Popery the Enemy and Falsifier of Scripture" (1844); and numerous articles in critical periodicals and in the "Encyclopedia Metropolitana."

HORNED FROG, or HORNED TOAD, an ignavian lizard of the genus *phrynosoma* (Wiegmann). In its general aspect it somewhat resembles a frog, and in its sluggishness a toad, hence the common names; but it is a true lizard, and in no respect a batrachian. The genus, which comprises about half a dozen species, all North American, is characterized by a more or less circular or oval body, flattened, and covered with tuberculated scales; head short, triangular, with prominent vertex, and sharp spines or rough knobs; the temporal region much developed; neck very short, and with transverse folds underneath; nostrils lateral, near the snout; tympanum visible but depressed; denotated margin on the flanks; no spinal or caudal crest; tail short and conical, with similar spiny scales; legs of nearly equal length and size, with 5 toes on each, moderate, the 2d the longest, and with sharp and curved nails; femoral pores, but no anal present. The species are found in California, Oregon, Mexico, and the S. W. states. For full descriptions of the species by Messrs. Baird and Girard, see Capt. Stansbury's "Expedition to Great Salt Lake," and vol. ii. of the "Mexican Boundary Survey." The best known species is the *P. cornutum*, about $4\frac{1}{2}$ inches long; the general color above is a dusky gray, with black bars and markings; below, silvery white. This species is not unfrequently carried to the north from Texas; in confinement it is sluggish and will rarely take food, but is said to be active in pursuit of its insect prey in the wild state; it is very gentle in its disposition. It passes the winter in a state

of lethargy in holes dug by various rodents, appearing about April and disappearing about October, at which seasons travellers are frequently annoyed by their seeking shelter from the cold night air in the folds of their blankets; their spiny covering makes them not very comfortable bedfellows.—This name has also been given to a true batrachian, a frog of the genus *ceratophrys*, in which the head is more or less roughened and spiny; it is 3 times as large as the common frog, with an enormous mouth; all the species live in tropical South America, and feed upon small rodents, birds, other frogs, toads, and mollusks.

HORNEMANN, FRIEDRICH KONRAD, a German traveller, born in Hildesheim in 1772, died in Tripoli in 1800. In 1797 he set out from Alexandria for the interior of Africa, but was made a prisoner during his stay at Cairo. Released by the French and provided with passports by Napoleon, he penetrated as far as Fezzan, and was about continuing his journey when he died. The diary of his journey from Cairo to Moorzook was published in London in 1802 in one 4to. volume.

HORNER, FRANCIS, a British statesman and essayist, born in Edinburgh, Aug. 12, 1778, died in Pisa, Feb. 8, 1817. He was educated at the high school and university of Edinburgh, studied for the bar with Henry Brougham, and was one of the originators, with him, of the "Edinburgh Review." His articles are chiefly on subjects connected with politics. His native city affording too limited a field for his ambition, in 1802 he removed to London, entered at Lincoln's Inn, and was called to the bar in 1807. He became intimate with the leading whigs, was one of the commissioners appointed by the East India company for settling the nabob of Arcot's debts, and in 1806 entered parliament as member for the ministerial borough of St. Ives. He lost his seat in 1807, when parliament was dissolved after a change of ministry, but 3 months afterward obtained a seat as member for Wendover. He spoke little at first, and then only on matters of business; but the ability which he displayed on all questions of political economy soon began to attract general attention. Perhaps his greatest effort was in the debate on the great bullion question in 1810, and it was mainly through his efforts that the unlimited issue of paper money by the bank of England and private banks was stopped. In 1811 he was offered by Lord Grenville a situation as one of the secretaries of the treasury, but declined it. In the general election of 1812 he was not returned to parliament, but the interest of Lord Grenville procured him a seat for the marquis of Buckingham's borough of St. Mawes. He became an acknowledged leader of the whig party in the house, but disagreed with Lord Grenville on the question of war after Napoleon's return from Elba, and consequently tendered the resignation of his seat, which the marquis of Buckingham refused to accept. His last speech was on June 25, 1816, in favor of

the Catholic claims and deprecating the harsh treatment of Ireland; soon after which he made a visit to Italy for the benefit of his health, and died abroad. His private character was no less honorable and upright than his public life, and his premature death was universally lamented. His character is thus summed up by Sydney Smith: "The commandments were written in his face, and I have often told him there was not a crime he might not commit with impunity, as no judge or jury who saw him would ever give the smallest degree of credit to any evidence against him; there was in his look a calm settled love of all that was good and honorable—an air of wisdom and sweetness; you saw at once that he was a great man, whom nature had intended for a leader of human beings; you ranged yourself willingly under his banners, and cheerfully submitted to his sway." Lord Cockburn, in his "Memorials of his Time" (Edinburgh, 1856), says of him: "It was the force of his character that raised him; and this character not impressed upon him by nature, but formed, out of no peculiarly fine elements, by himself. There were many in the house of commons of far greater ability and eloquence, but no one surpassed him in the combination of an adequate portion of these with moral worth." Brougham, Mackintosh, Romilly, Alison, and others equally eminent in literature and in public life, were also his intimate friends, and in their speeches and by the pen have borne similar testimony to his virtues and his greatness. Jeffrey wrote that he had known no instance in which so warm and so honorable a testimony from men of all parties had been borne to the merits of a private individual. His monument by Chantrey was erected in Westminster abbey. His "Memoirs and Correspondence" was edited by his brother Leonard (2 vols., London, 1843; Boston, 1853); in the appendix to which may be found several of his more important speeches in parliament.—LEONARD, younger brother of the preceding, a Scottish author, born in Edinburgh in the latter part of the last century. He was educated in Edinburgh, and at an early age manifested a taste for geological studies. In 1827 he received the appointment of warden of the university of London, in the organization of which he largely participated; and since 1833 he has been one of the principal inspectors under the factories act, in which capacity he has labored with benefit in behalf of the operatives in the large manufacturing towns. He is the author of several pamphlets on social questions, of papers on scientific subjects, and of an address before the geological society of London, of which he was president in 1847. In 1843 he edited the "Memoirs and Correspondence" of his brother Francis (2 vols. 8vo.).

HORNET, a stinging hymenopterous insect, of the family *Diptoptera* and tribe of *Vespariæ* or wasps, under which title their family and generic characters will be given. The European hornet (*Vespa crabro*, Linn.) is about an

inch long, larger than the common wasp; the thorax is black in the middle, and brown elsewhere; the abdomen is black with yellow borders, and below yellow with black spots; the upper lip yellow, and the eyes blackish; the body smooth; the wings are longitudinally folded, and the mandibles strong and denticated. The hornets, like the wasps, live in society, in nests containing males, females, and neuters, the last two of which do all the work and are armed with a venomous sting; their societies are republican, several females and their broods living and working harmoniously together. The nest is built in decayed trees, old posts, and in almost any sheltered place in barns and porticoes; it is of a rounded form, made of coarse materials, and of the color of faded leaves; the materials of which the nest is composed are prepared from particles of old wood or bark by their mandibles, reduced to a kind of *papier maché* or soft pasteboard; with this, after the inside of the nest has been thickly plastered, they make horizontal combs suspended from above by strong columns, the central being the largest; the cells are hexagonal, with the opening downward. A few females, or perhaps a single one, having escaped the rigors of winter, begin to construct a few cells, and lay their eggs in the spring, the first broods being neuters, which when perfect help their mothers in the domestic economy of the nest; the larvæ are footless, each enclosed in a separate cell, where it is fed on insects and honey stolen from bees; when the larvæ have acquired their full growth, they line the cell with silk, covering the opening, and in this undergo their metamorphosis. The neuters aid in building the other nests, and in feeding the successive broods of larvæ; as the family increases, new cells and additional platforms are constructed. The young females and young males come forth about the beginning of autumn, and all larvæ which cannot become perfect before cold weather are destroyed by the neuters; the males perform no labor; both sexes meet on the trees in autumn, feeding on saccharine juices, and soon perish from the cold. There are about 150 individuals in a nest. Hornets prey upon other insects, especially flies, upon flesh, and ripe and sweet fruits; they also rob bees of their honey; a hornet's nest suspended in a place infested by flies will soon perceptibly diminish their numbers. If their nest be disturbed, they fiercely attack and sting the intruder, causing a painful and frequently dangerous wound. The wasp called hornet or "yellow jacket" in New England is the *V. maculata* (Linn.); it is too common to need any description, and its habits are those of the family; it is often seen on trees infested with aphides or plant lice, for the sake of devouring and of carrying to its young the honey dew or sugary excretion of these insects. This species is very fierce if attacked. The nests of some of the South American species, cleared of the platforms of cells, are used as baskets, being light, strong, and very tight. Hornets,

like the other wasps, make no honey. Many large wasps, varied with black and yellow, are called hornets in different parts of the country.

HORNPIPE, a wind instrument, once a favorite with the Welsh peasantry, and probably still in use among them, consisting of a wooden pipe with holes at stated distances, and a horn at each end. The tone is pleasing, and somewhat resembles that of the hautboy. For this instrument was composed the lively dance tune known as the hornpipe, a name applied also to the dance which accompanies it. Both the tune and the dance are supposed to be of English invention, and the former is generally in triple time, 6 crotchets in a bar.

HOROLGY. See CLOCKS AND WATCHES.

HORROCKS, or **HORROX**, **JEREMIAH**, an English astronomer, born in Toxteth, near Liverpool, about 1619, died Jan. 3, 1641. At Cambridge he paid particular attention to astronomy, and he has described the difficulty he experienced in finding the works of good authors on the subject. After devoting some time to the works of Lansberg, which he afterward regretted, he found the writings of Tycho Brahe and Kepler, and studied them with great attention. He was the first to observe the planet Venus on the disk of the sun. This observation was made Nov. 24, 1639, and his account of it, called *Venus in Sole visa*, was printed by Hevelius at the end of his *Mercurius in Sole visus* (Dantzic, 1662). He was also the author of a theory that the lunar motions might be represented by supposing an elliptic orbit, if the eccentricity of the ellipse were made to vary, and an oscillatory motion given to the line of apsides. Newton afterward verified his suppositions, and showed that they were consequences of the law of gravitation. The remaining works of Horrocks were published by Wallis in 1672, with an exposition of his lunar theory by Flamsteed.

HORRY, an E. district of S. Carolina, bordering on the Atlantic and N. Carolina, bounded W. by the Little Pedee, which flows into the Great Pedee on the S. W. border of the district, and drained by the Waccamaw river; area, 1,200 sq. m.; pop. in 1850, 7,646, of whom 2,075 were slaves; white pop. in 1859, 5,727. It has a low marshy surface, and is partly covered with large forests of pine. The soil is generally poor. The productions in 1850 were 127,100 bushels of Indian corn, 137,303 of sweet potatoes, and 484,970 lbs. of rice. There were 50 grist mills, 23 turpentine distilleries, 33 churches, and 488 pupils attending public schools. Capital, Conwayborough.

HORSA. See HENGIST.

HORSE, a well known, simple-hoofed, non-ruminating quadruped, constituting the soliped family of Cuvier's order of *paedydermata*; and, in Prof. Owen's system, the family *solidungula*, of the order *perissodactyla* (odd-toed), of the group *ungulata* (hoofed), and of the mammalian sub-class *gyrenecephala* (wave-brained). Zoologically considered, the family consists of the single genus *equus* (Linn.), distinguished

from all other quadrupeds by having only one apparent toe and a single solid hoof on each foot, although under the skin on the sides of the metacarpal and metatarsal bones are the rudiments of two others on each limb. The dentition is: 6 sharp and cutting incisors in each jaw; 6 molars on each side of each jaw, with crowns of a quadrangular form, and having the surface intersected by deep plates of enamel arranged in 4 crescentic masses, and with a small additional disk of enamel on the inner border of the upper teeth; there are also, in the males, 2 small upper canines, and sometimes lower ones, usually absent in the females; there is a considerable space between the canines and the molars, opposite the commissure of the lips, which man has availed himself of to introduce the bit, by which this powerful, intelligent, and useful animal is subjugated to his uses; in the young animal there are also deciduous molars. The different species of *equus*, as the zebras and the asses (mentioned in the article Ass), so resemble each other in outward form and internal economy, that the description of the typical species, the horse, will answer for all, with the exception of a few structural peculiarities; they are so nearly related to each other, that they will breed together, producing more or less fertile hybrids, as is well known in the cases of the horse and ass, and both with the zebras, &c. The skull of the horse is remarkable for the great width between the orbits, its flatness, the length of the face compared with the cranium, and the vertical depth of the lower jaw; the intermaxillaries project considerably beyond the nasal bones, the latter overhanging the cavity of the nostrils; the temporal arch is short, straight, and situated in the posterior third of the skull. The cervical vertebrae are of large size, and the posterior are oblong with short processes, so as to secure great freedom of motion in the neck; the dorsals are 18, with short transverse processes, and very long spinous anteriorly to afford origins for the ligament which supports the head; the lumbar are 6 (but 5 in the ass), broad and firmly joined together, with remarkably well developed processes, especially the transverse; the sacrum is a single bone, made up of 5 consolidated vertebrae, in a continuous line with the rest of the spine, and united to the last lumbar by the very large articulating oblique processes of the latter, securing a springiness in this region in leaping and galloping; the caudals vary from 17 to 21, having the form of vertebrae only in the upper ones. The chest is capacious, compressed laterally in front, and prolonged in advance of the first rib so as somewhat to resemble the thorax of a bird; in the middle and posterior portions it is rounded, and extends far back toward the pelvis; the ribs are 18 pairs, the anterior broad and massive (8 being true), and the posterior more slender. The clavicle is absent, and the coracoid process very rudimentary; the shoulder blades are triangular, with a prominent spine, closely approximated to the

chest, transmitting the weight of this half of the body perpendicularly to the ground; the arm bone is short and strong; the forearm consists almost entirely of the greatly developed radius, the ulna being a mere appendage consolidated in the adult animal to its posterior surface, though its olecranon process is of large size, affording a powerful purchase to the extensor muscles; there are no movements of pronation and supination, but only of hinge-like flexion and extension. The carpus or wrist has 7 bones in 2 rows, 4 in the upper and 3 in the lower; the metacarpus consists of a single long bone, the shank or cannon bone, and of 2 smaller supplementary pieces; this long bone represents the middle finger metacarpal of the human hand, and the others the ring and forefinger metacarpals, those of the thumb and little finger being absent. The fore foot is made up of 3 bones representing the 3 phalanges of a middle finger, called respectively the great and little pastern and coffin bones, the latter large and crescentic, supporting the hoof; there are also 3 sesamoid bones implanted in the flexor tendon of the foot. The pelvis is remarkable for the elongation of the ilium and the outward extension of the crest and spine; the thigh bone is massive, and so short that it is entirely concealed under the integuments of the trunk, what is commonly called the thigh being in reality the leg; the leg is formed almost entirely by the tibia, which is very strong at its upper portion, the fibula being a long slender bone among the muscles lost about the lower third of the tibia; the tarsus consists of 6 bones, the astragalus or cockle bone, the os calcis or heel bone, the cuboid, the navicular, and the middle and lesser cuneiform bones, the internal or great cuneiform being absent with the great toe which it supports; the metatarsus and the hind foot are constituted as in the anterior limb, and the bones have received the same names. The muscular system of the horse is very different from that of man, and has been described minutely in treatises on veterinary medicine. The *panniculus carnosus*, of which the *platysma myoides* of man is a rudiment, is greatly developed, and very movable, affording support and protection to various organs. The spinal muscles are of great extent and strength, especially in the neck and tail, which admit of much precision and grace of motion; the extensors of the forearm, the *gluteus medius* (the kicking muscle), and the muscles of the loins, extremities, and neck, are generally very powerful; the muscles of the face, particularly those of the lips and nostrils, are largely developed, giving the well known variety of facial expression in this animal. The molar teeth of the horse may be known from those of other herbivora by the arrangement of the patches of enamel above referred to, and by their great length before they divide into fangs. The incisors are close together in a circle at the end of the jaws, slightly curved, with long simple fangs; the crowns are broad, thick, and short, of an elliptical form before

they are much worn; a fold of enamel penetrates the crown like the inverted finger of a glove, which presents an island of enamel enclosing a cavity partly filled with cement and partly by the food; this is called the "mark," and is useful in determining the age of the animal, disappearing in very old horses, whose teeth get worn below the penetrating fold; according to Owen, it is usually obliterated in the middle incisors of the 2d set at the 6th year, and in the next and outer pairs in the 7th and 8th years respectively in the lower jaw, remaining longer in the upper, and in both its place is indicated for years by the darker color of the cement, even to the age of 16, after which the summits begin to assume a triangular form; the milk incisors are all shed before the age of 5 years. The salivary glands, especially the parotid, are remarkably developed; the stomach is simple and capacious; the intestinal canal is long, but short in comparison with that of the ruminants; but the colon is of enormous capacity, as also is the cæcum, apparently occupying the greater portion of the abdominal cavity; the small intestine is about 56 feet long, with a circumference of from 2½ to 6 inches; the cæcum is 2½ feet long, and 2 feet in circumference at the widest part; the colon and rectum are 21 feet long, the former averaging 2 feet in circumference; the whole canal, therefore, is about 80 feet long. The liver weighs between 4 and 5 lbs., having no gall bladder, and the spleen 12 ounces; the urinary bladder is small in comparison with the size of the animal, its circumference when moderately distended being about 1½ feet; the mammary nipples are 2, inguinal, and have at the base a hollow cavity which permits the accumulation of a considerable quantity of milk, which is often removed by man as an article of diet, especially for invalids. The hoof of the horse presents an admirable adaptation to secure solidity and elasticity in an instrument of progression; the whole exterior horny covering, to which the shoe is attached, composed of modified epidermic structure (see HORN), is a hollow cone truncated above, into which the coffin bone is received; highest in front, it gradually diminishes backward, where it is suddenly turned inward, becoming mixed with the sole, supporting the under parts of the foot, and protecting the sole and the frog from too rough pressure against the ground; this internal wall, called the "bars of the foot," by its sloping direction distributes the weight of the body toward the sides of the hoof, with whose numerous perpendicular horny laminae interdigitate similar processes from the vascular surface of the coffin bone. In the triangular space in the centre of the foot is an elastic horny mass called the frog, its base connecting the posterior curves of the hoof, the sides united with the bar, and the point extending about to the centre of the sole; on the sides are deep channels, to allow of its expansion and render the foot elastic; its actual thickness in horn is not so great

as farriers seem to think, from the freedom with which they use the paring knife; in a well formed foot, the base of the frog ought to occupy a 6th part of the circumference of the circle of the hoof; in the centre of the frog is a horny conical cavity of considerable depth, which protects the partially cleft foot from further rupture, adds to the elasticity, secures a firmer hold on loose soils, and passing above into the substance of the sensitive frog serves to unite firmly the two halves of the foot, which are completely divided in ruminants; this horny cone has been called the frogstay or bolt. The sensitive frog falls into the inverted arch of the horny frog, which are thus held mutually in place and preserved from external shock. The sole is an irregular plate of horn, closing up the lower opening of the foot, of an arched form, abutting everywhere against the sides of the wall, another contrivance for securing elasticity. The foot of the horse, therefore, though solid in front, is partially cleft behind, so that the terms *solidungula* and *solipoda* cannot strictly be applied to it; indeed a solid, continuous, unyielding circle of horn would be very painful if not entirely useless as an instrument of active progression; this beautiful structure, however, is sadly interfered with in almost all methods of shoeing. Immediately under the hoof are extensive cartilages, attached to the last two bones, protecting the upper part of the structure and adding greatly to the elasticity of the foot, and permitting the movements of the coffin bone within the hoof; in old horses these cartilages may become partially ossified, and are then called ring-bones. Under the hoof is also a very sensitive and vascular layer, from which the hoof originates, analogous to the soft core of hollow horns and the matrix of nails. The eyes of the horse are large, and the sight excellent, and capable of distinguishing objects by night; the ears are large and very movable, and the sense of hearing very acute, as in other timid and comparatively defenceless animals; the sense of smell is also acute, as is seen in their selection of food and in the recognition of their masters; the cutaneous sense is very fine, and the tactile powers of their movable lips exquisite. The food is exclusively vegetable, in a state of nature. The time of gestation is about 11 months, and the foal in the domesticated state sucks 6 or 7 months; the sexes are separated at 2 years, at 3 they may be broken, and at 4 be ridden. The disposition of the horse is naturally gentle and confident, which qualities have made it the most useful of animals in all the arts of peace and war; it is bold, however, in the defence of its young, and occasionally an animal is vicious, either naturally or from bad treatment in youth. As we have horses varying in size from the Shetland pony to the Flanders dray horse, and in proportions from the thorough-bred racer to the Canadian cob, with every variety of color, so we find great diversity in their moral qualities; some are bold, intelligent, or good-natured, and

others timid, stupid, or cross, and by care or from neglect each of these qualities becomes the characteristic of a race. Their movements are many; beside the walk, trot, gallop, and amble, pace, or rack, some horses gallop with the fore legs and trot with the hind, others move each leg separately in succession, and others execute many artificial movements, the result of education. The horse is quick to perceive and has an excellent memory, two qualities which render his education easy and extensive; he is capable of deep and lasting attachment. The neigh or voice of the horse is well known, the females exercising it less frequently than the males. The horse rarely lives to a greater age than 30 years, and is not serviceable for speed or very hard work for more than half this period. In compact form, elegance of proportions, and grace of movement, combining speed and strength, it is surpassed by no animal; sculptors and painters have made the horse the subject of their chisels and pencils, and poets, sacred and secular, have sung its praises from time immemorial. Almost every part of the horse after death is useful to man; his skin is valuable for gloves, his hair for making cloth, his bones for buttons and for grinding into fertilizers, his flesh as food for hounds if not for man, his hoofs for making glue, and his intestines for the manufacture of delicate membranous tissues; so that the horse, said in ancient fable to have been created by Neptune as the animal most useful to man, can safely lay claim, both living and dead, to being of the greatest value to the human race. The experience of continental Europe has amply proved that horse flesh is a savory, nutritious, and wholesome article of food; in France scientific committees appointed by government have thoroughly investigated the subject, and have pronounced from specimens before them on the table that, whether in soup, roasted, boiled, or otherwise cooked, it is fully equal to beef.—The original native country of the horse is not certainly known; but he was most probably first brought under the subjection of man in central Asia or in the part of northern Africa adjacent to Nubia and Abyssinia. Useful as is the horse to man, his more humble brother, the ass, was preferred by nations of remote antiquity, from its easier management, hardier nature, and the homelier, cheaper, and less abundant food required to keep it in good condition; when greater wealth, with its consequent wars and pursuits of distant commerce, became common, the more lordly, strong, swift, and expensive horse was highly prized; the number existing in Egypt, Asia, Greece, and Rome, and used for warlike purposes, was very great. Horses exist in the wild state in northern Asia and in America, the feral descendants of individuals formerly domesticated; in such cases they live in large troops, as on the prairies of the West, the pampas of South America, and the plains of Tartary, conducted in their wanderings and battles by an old male who has conquered

the position of chief by superior strength and courage, and who, when his powers fail, is peacefully superseded by another possessing the same qualities. When danger threatens, they close their ranks, and present an unbroken circle of heels to the enemy, which is generally some of the larger carnivora. The horse (*equus caballus*, Linn.), whether originating in northern Africa or in northern Asia, probably exists nowhere at the present time in its original character; but wild horses, which have lived independently for many generations, entirely exempt from the influence of man, afford a tolerable idea of what the primeval animal was. Wild horses, as now met with, are generally smaller but more muscular than the domesticated ones, with less variety of color, stronger limbs, larger head, longer and less erect ears, more bushy mane, less sleek coats, and smaller and more pointed hoofs. When these troops fall in with domesticated horses, the latter are almost certain to rush after in a wild stampede and to be irrecoverably lost. The wild horse, even when adult, is readily brought to the domesticated state; the American Indians are very dexterous in taking them on the prairies and the pampas by means of lassos, and much of the wealth of many tribes consists in their herds of these animals roaming without any apparent control. The wild troops have no fixed place of abode or of repose, frequenting the richest pasturages, and resting at night in dry and sheltered situations; they have great dread of storms and high winds, and a loud thunder clap will put them to flight in the utmost confusion and alarm.—Most countries have peculiar breeds of horses, adapted to the climate and wants of the region. In the deserts of Arabia we find a horse remarkable for fleetness, endurance, and docility. The Arabian horse has been described under that title; its blood by intermixture has been made to improve other races of all sizes and constitutions, producing the breeds most highly valued both in Europe and America. The Tartar horses are small and ewe-necked, but hardy, accustomed to inclemencies of weather and scarcity of food, performing long journeys with great speed; these are almost as wild as their masters, little cared for, and esteemed only for speed, endurance, and as food. The Persian horse is descended from the Arab, but is inferior in speed and less enduring; it has a finer head and a better turned croup than the Arab; it was brought to England in the reign of Elizabeth, and by its cross produced an excellent breed. The showy Barbary horse has been described under BARB; the Spanish breed, mixed with the barb, long enjoyed the highest reputation in Europe both for civil and military purposes; their proportions were fine, their movements elegant and spirited, and their disposition mild and docile; they have now much degenerated from want of care. The Turkish horses have the chief characters of the Arab, from which they are descended. The horses of Germany and

France have been modified by all the above breeds, and are very hardy, and able to endure the services of military campaigns better than any horses except perhaps the English: the Dutch breed are very large, and excellent for draught, but good for little else. The English have paid the most attention to the breeding of horses, and have surpassed all other nations in the one quality of speed; the English racer is unequalled for quickness and endurance, in which respects he exceeds the best horses of the original oriental stock. America has taken advantage of the best breeds of the old world, and can compare favorably with any country; her trotting horses have no superiors in their peculiar gait. The race horse is the product of the Arabian with the native English breed, commenced by James I., improved by Charles II., who imported barbs and Turkish stallions, and crossed by the Darley's and Godolphin Arabian, to the blood of the latter of which may be traced the best racers of England. The best height for a race horse is from 5 feet 2 to 5 feet 3 inches; $1\frac{1}{2}$ minutes is first rate time for a single mile; West Australian's Ascot cup race in 1854 was $2\frac{1}{2}$ miles, with 8 st. 5 lbs., in 4 minutes and 27 seconds. The most serviceable hunter is the produce of the crossing of a stallion of the first blood with a less pure mare; according to its blood, it is famous in the field, on the road, in war, and for draught; the hunter is called upon to exercise his powers on very different grounds and with heavier weight than the racer, and ought to have a long frame, shorter legs, and more vigorous shape than the latter, with moderate size, firm constitution, and great courage. Crossing the thoroughbred with cold-blooded mares produces the more strong-limbed varieties used as carriage horses, roadsters, chargers, and cavalry horses. Another and a different race is seen in the different kinds of dray horses, remarkable for strength, intelligence, and docility. For the various local breeds of this and other countries, and for the general management and diseases of horses, the reader must consult the numerous special works on these subjects.—There is no doubt that the horse was unknown to the natives of America at the time of its discovery by Europeans, and it is certain also that this animal inhabited this country during the postpliocene period, contemporaneously with the mastodon and megalonyx; its fossil remains, chiefly molar teeth, have been so frequently found, especially in the southern states and in South America, and have been so carefully examined by Dr. Lund, Prof. Owen, Prof. Leidy, and other competent paleontologists, that no doubt can remain of the former existence of the horse in the western world. The *E. neogaus* (Lund) and *E. major* (De Kay), two species of the closely allied genus *hipparion*, and one of *hippotherium*, indicate that the equine family were well represented in America in former geological periods; whether this ancient horse, of about the same size as the recent one, and distinguished by the usually more complex folds of the enamel

of the molars, became entirely extinct before the creation of man, may admit of question. Prof. Leidy says there is no room to doubt the former existence of the horse on the American continent, at the same time with the mastodon, and that "man probably was his companion." The fossil horse has also been found in the old world, in the pliocene of Europe with the mastodon and tapir and through all the diluvial period, and in the upper tertiary of Asia; there are 2 or 3 species described in Europe, and as many in Asia. From this it appears that the horse inhabited the old world as well as the new before the advent of man; and some of these antediluvian species may have become extinct, while others persisted in a declining condition during the early part of the human epoch.—See Hamilton Smith, on the natural history of the *equidae*, in the "Naturalist's Library."—HORSE BREAKING, or TRAINING, the art of educating the horse for use, includes in its full sense not only his simple familiarization with the harness and saddle, but the preparation of the race horse and the refinements of the manège. The process is earliest commenced upon the race horse, especially in England, where races of two-year-olds occur constantly during the racing season. The trainers begin with the weaning of the colt; but, as is the case with all race horses, they attend chiefly to their physical condition, which they bring to great perfection by high feeding and sweating, and no further education is given than will enable the animal to bear the saddle, bridle, and jockey that guides him in the contest. The Arabs, like most other equestrian peoples, commence the education of their horses at the age of 18 months, advancing by very slow degrees, and with the greatest caution (the bridle and saddle are first put on at from 24 to 27 months), their object being not only to render them obedient to every wish of the master, but to confirm their strength and develop their physical qualities to the highest degree. A thoroughly educated Arab horse of the best blood will not only endure a wonderful amount of prolonged effort, but possesses a suppleness and docility not surpassed by the most highly educated animals of the civilized manège. The Arabs treat their colts with great kindness, but as they become older they are subdued by a severe use of the spur and by very harsh and powerful bits. With his savage spurs the skilled Arab horseman punishes a restive or disobedient steed by making frightful scars along his belly, drawing blood at every stroke. In civilized countries, the breaking of horses, apart from those intended for the turf, generally begins at the age of about 3, though it should properly be commenced much earlier. It has generally been performed in a harsh and brutal manner, until Mr. John S. Rarey (born in Madison, Franklin co., O., about 1825) brought into notice, in the year 1856, in England, a more humane and scientific system. The elements of Mr. Rarey's method are derived from the practice of circus trainers, who have long used the same

devices as a means of teaching horses the tricks required in their exhibitions; but to him belongs the credit of perfecting them, and of being the first to apply them to breaking horses intended for any kind of work. Mr. Rarey, who is not only a person of remarkable coolness and quickness of mind and of movement, but who possesses in a rare degree that peculiar magnetism which gives man a moral power over animals, has repeatedly by his voice and manner soothed the most ferocious horses to such a degree that he has been able to approach them without injury. His process consists in fastening one fore leg by a strap (which, like all his utensils, he first allows the horse to see and smell) passed around the pastern and buckled close to the forearm. Another strap is then fastened to the pastern of the other fore leg, and is either passed under a surcingle, previously buckled about the horse's body, and its end held in one hand, or it may be held over his back. The horse is then gently urged forward, and as he raises his free fore foot to step, it is pulled from under him by the operator. This brings him upon his knees. A struggle ensues, in which the man is sure to be the victor. Next, by a sufficient pressure, the horse is thrown upon his side and lies helpless. The operator then soothes him with the hand and voice, removes the straps, and after a short period allows him to rise. A single application is generally sufficient to reduce even a vicious horse; but the repetition of the process is sometimes necessary, and if judiciously employed is never injurious. In extreme cases a strap fastened around the gullet and the top of the head and gently choking the animal is very efficacious. In taming a zebra in London in 1858 Mr. Rarey also resorted to severe punishment with the whip.—When a horse is thus broken or tamed, his elementary education only is completed. For the subsequent process the most scientific and rational method is that of F. Baucher of Paris, who has invented a complete system of equine gymnastics, calculated to give grace, ease, lightness, and docility to its subjects. M. Baucher holds that by proper suppling of the neck and jaw all horses may be freed from the disposition to lug or pull upon the bit, which renders many excellent animals so disagreeable to the rider or driver. First, standing by the head of the horse, on which a double bridle has been placed, he proceeds to teach the animal quietness in mounting, to supple the muscles of the upper part of the neck, and bring the head into the proper position, namely, the face perpendicular to the ground. This is commenced by standing in front of the horse, holding the reins in the left hand and gently tapping on his breast with a riding whip. At first the horse endeavors to retreat, but the blows are continued until he comes forward, in doing which his head naturally tends to the perpendicular; the operation is repeated until he comes toward the teacher at the mere touch of the whip. Next his head is still further brought into position, and his under jaw is suppled by crossing the snaffle reins

around the jaw, and drawing them tight with the hands until he makes the movement known as champing the bit. Next with one hand the snaffle reins are held before the face, while the curb reins are drawn gently but firmly behind the jaw, till he champs the bit. In each case the pressure must be continued until the horse ceases all resistance in his jaw, when the pressure should cease, and the horse be gently patted as a reward. After repeating these lessons till the horse has ceased to resist, the teacher next proceeds to supple the muscles on the sides of the neck by gently drawing the head with the reins first to one shoulder, then back to the natural position, and then to the other shoulder. After this the teacher mounts, always with spurs, and begins to teach the horse to back. This is done by a pressure of both spurs, which causes the horse to bring his hind legs under him resting his weight on his haunches. At the same time, by gently bearing on the reins, the fore feet are drawn backward and he learns to step in that direction. This lesson, in which one or two steps only should be required at the beginning, is of the highest utility in developing the hinder muscles and in confirming the docility of the animal; but at first it is very fatiguing, and should not be prolonged above two or three minutes at a time. At the same time the lessons in walking are carried on, care being constantly taken to maintain the right position of the head by the gentle use of the curb. The animal is now educated to turn either way by the simple pressure of the rein on the side of the neck opposite to the direction in which he is required to turn, while a pressure of the leg and spur on that side keeps him well together and facilitates the operation. His quarters are now suppled by walking sideways without advancing forward; this he is made to do by bearing on one rein and by the spur on the flank. Great suppleness is also given to the quarters by the pirouette, in which the fore feet stand still as a pivot, while with the spur the hinder parts are made to describe a circle. Next he is educated in trotting, the object of the teacher being to develop perfect equilibrium, which is indicated by the proper position of the head, and to preserve the lightness of the animal and make him free from any disposition to lug upon the bit. The canter, the gallop, and leaping bars and ditches come afterward, and must be taught with the same cautious advances as characterize the whole process. When a horse will follow the slightest indication of the hand and leg in changing his direction; when he will trot at speed without losing his equilibrium; when he will start in the canter with either foot foremost at the pleasure of the rider; and when he may be stopped short even when at speed by a touch of the rider's heels, he may be pronounced sufficiently trained for all the ordinary purposes of the saddle; though instruction in the higher arts of the manege will still further improve his muscular powers, and increase the perfection of his general docility. In training carriage

horses a much less complicated process is required, as their use is simpler; but even for them the flexions of the jaw, neck, and hind quarters, which we have indicated, will be found to be very useful. See F. Baucher, *Œuvres complètes* (Svo., Paris, 1854); "Method of Horsemanship Founded on New Principles" (12mo., Philadelphia, 1852).—HORSEMANSHIP, or EQUITATION, the art of riding and managing the horse, is of great antiquity. Though the more civilized nations who have left us any records seem first to have used this animal in harness, there are indications that he was used for riding very early. In the oldest Egyptian paintings the horse is seen only in the war chariot. At the siege of Troy we read only of the charioteer, but the stories of the centaurs and of Castor and Pollux, which had already passed into mythology, lead to the inference that the horse was ridden by some other people at a far antecedent period. In the paintings of the palace of Nimroud, which are supposed to be at least coeval with the siege of Troy, and which Layard the discoverer referred to 1500 years B. C., horsemen are exhibited both in the chase and war. It is not improbable that the first horses used by the Greeks were too small to be conveniently ridden. The horses of the Quirinal, like several other early Greek representations, are mere ponies by comparison with the human figure. In the friezes of the Parthenon, though mounted, they are yet small. The ancients, however, who seem usually to have ridden without a saddle, do not appear to have known the use of the stirrup. The Parthians were among the most famous of ancient horsemen, and in battles with the Romans were exceedingly efficient as archers on horseback. Frequently the mounted steed is represented without a bridle, and the Numidian cavalry are said to have guided and restrained their horses without it. The occasional practice of some orientals, and of the wild tribes roaming over the western prairies of North America, renders this statement less improbable than at first sight appears. Horses in the East are often trained to stop in full career at the mere voice of the rider; and a Comanche Indian may be frequently seen to jump on the bare back of a wild and untrained horse without bridle or halter, and guide him by the simple expedient of covering with his hand the eye of the animal on the side opposite to that in which he wishes to direct it. In modern times, when the number of horses has been immeasurably increased, and when they have been used for different objects by the most varied nations, the art of equitation has been proportionally developed, while its practice has been modified by the mere fact that all or nearly all since the middle ages habitually employ the saddle and the stirrup.—In feudal times the kind of horse most used among western horsemen was the great war horse, an animal preferred on account of its size and ability to carry the heavily armed knights and overwhelm adversaries by its weight. From Barbary, however,

a mixture of oriental blood was introduced among the horses of Spain, from which the lighter and more graceful animal known as the Spanish jennet was derived; and with a view to the characteristics of these different kinds of horses the Italian, French, and German systems of equitation were devised. In the riding schools of Italy the art was early pushed to its extreme of fanciful perfection. There the rider, without perceptible motion of the hand or legs, made the steed, as if in obedience to mere volition, capriole, curvette, piaff, or volt. Its chief merit consisted in the attitude of the cavalier, in the exquisite control under which the horse was brought, and in the manner in which it brought out the points the animal possessed, or artificially simulated graces it was not possessed of. But it did not enable the rider to control a horse which had not been specially educated for the purpose, nor any wild or vicious horse, nor to ride fast, nor far, nor over difficult places. This system has been adopted with various modifications by all scientific riding schools, and by all regular cavalry in the world. Its main characteristic is riding long, or with the leg straight. In the original Italian and Spanish school the position of the limb was as perpendicular as if standing, and though since gradually shortened to enable the rider in some measure to secure his seat by compression of the thigh, knee, and calf, it still obliges him to depend chiefly on preserving the centre of gravity by balancing his body. This style of riding necessitates the placing of the fore part of the foot to the toe points in the stirrup, which constitutes a double spring, one formed by the toe point and ankle, the other by the knee. The opposite system is that of riding short, that is, with the leg considerably bent, whereby the rider depends on cohesion or what is called the cling, rather than the balance. This mode has been adopted by nearly all equestrian nations, or those among whom the use of the horse is most habitual, and by all those who ride horses of a vigorously-motioned breed, viz.: the Arabs, Turks, Tartars, Persians, Magyars, Cossacks, English fox hunters, Circassians, and Egyptians. With the Circassians, from whom the Mamelukes were recruited, it is pushed to the extreme, the leg being doubled in the form of a V placed horizontally (<), whereby the muscles of the leg and thigh are thrown into the greatest possible prominence and develop their utmost adhesive power. It has been tested that, seated in this manner, a weak man can easily pull from the saddle a strong one riding with the leg extended. This tenacity of hold has been found not only useful but indispensable in resisting the various movements of horses of certain breeds, especially in traversing broken ground and in violent leaps; beside which in some cases the position of the horseman, as for instance in the drop or leap down a high bank, enables him by throwing his body back to preserve an equilibrium which would be impossible in riding long.—

The Arabs and most of the Mohammedan nations for the most part allow their horses only to walk, to gallop, or to canter, and rein them up suddenly by means of powerful curbs in full career. From the high caste Arab horses imported into England descends the thorough-bred now scattered over a large part of the world, and alone distinguishable, like his parent stock, by his capability for training, *i. e.*, reduction to a condition in which, through sweating, feeding on high food, and comparative abstinence from water, he gets rid of all superfluous fat, while retaining the necessary amount of muscle for prolonged exertion. But in Great Britain, bred at first solely for racing and the chase, encouraged to his fullest stride, and never checked suddenly, this horse became larger boned and more angular than the Arab, uniting roughness as well as vigor in his motions. Hence, and for the uses to which he was put, the short system of riding was indispensable; and when it was found that his blood, either pure or mixed, showed an equal superiority in trotting as in running, there arose the habit of rising in the seat to the trot. It is unquestionable that thereby both horse and man are eased; and though the motion is commonly ungraceful, accomplished riders time the rise so well as to render it almost imperceptible. The English equitation, or that of the fox hunter, the jockey, and the groom, though undoubtedly the best by which to sit a vicious horse, to ride him fast or far, or lift him over obstacles, was long thought entirely inapplicable to cavalry from not allowing over him sufficient control. Thorough-bred horses, or those having a large share of thorough-bred blood, are usually ridden with the bridoon or snaffle, and sometimes, for want of the proper suppling of the neck and jaw, cannot be restrained by the curb, which by over afflicting only maddens the animal. From these causes, in the Peninsular war the British squadrons, when filled with blooded horses, were often inefficient or uncertain in comparison with the French cavalry, then miserably mounted, but moving with a unity which insured superiority. Though the British cavalry rode with the long stirrup, it was held that by shortening it like the fox hunters such a kind of horse would still be unmanageable for purposes of war. But the Circassians, who use nothing but the snaffle to ride high-bred, and often thorough-bred horses, are the most dexterous in their management in the world, wheeling in the shortest turns and stopping at full speed. At a gallop they will hit the figure of a man behind them with a rifle, or a coin on the ground with a pistol, and pick it up from the ground as they return. But occasionally they hold the reins in both hands without quitting their weapon, and one stirrup is rather longer than the other to enable them to fire behind them as they fly. The Cossack, with a short stirrup and snaffle bit, manages very dexterously a horse inferior to the Circassian, and rides him by this method great distances with ease.

A marked advantage of the very short stirrup is that the rider's heel touching the flank of the horse enables him to use the spur with rapidity and without motion of the leg. The orientals ride with the foot borne in their shovel stirrups, and the fox hunter and steeple-chase rider thrust it in up to the instep in hard riding, rather sinking the toe to prevent the irons from being jerked away by the violence of the motion, and to bring the spurred heel into a more convenient position. The Mexicans and Spanish Americans generally have derived both their horses and equitation from old Spain. They are very dexterous in the use of the lariat or *lasso*, and in some parts of the *bolos*, a missile consisting of three balls separating at the end of three cords meeting in the centre. As horsemen they are however far surpassed by the Comanches, Apaches, and various tribes of Indians, who at a gallop make a shield of the horse by hanging by a leg and arm along its side, and who on inferior and grass-fed horses perform generally the same feats as the Circassians upon thorough-breds often in full training. The cavalry style is well adapted to enable the soldier soon to learn the management of an inferior horse, the movements of which, compared with those of a thorough-bred, are like the spring of a piece of cane to that of a steel foil. But an accomplished manège or circus rider is often dismounted from or carried away by a wild thorough-bred, which a boy of 10 years old rides with ease and safety. By the long mode a very little instruction enables the rider to present a very respectable appearance on an inferior horse, or on one thoroughly broken, whereas in riding short the pupil has often become an efficient horseman before he ceases to be grotesque, and sometimes always continues so. The latter also requires long practice and proficiency before it becomes available for any other purpose than mere locomotion. Hence probably another reason why it is so extensively but exclusively adopted by equestrian nations. —Baucher of Paris, the inventor of the system of educating the horse, which we have described above, has also introduced a mode of instruction in equitation, which is especially worthy of attention. He begins by a regular course of gymnastics designed to give strength and flexibility to all the muscles brought into play in riding. Thus by a progressive series of exercises, he develops and supplies the muscles of the loins, the thighs and legs, the back, the arms, and the wrist, brings forward the chest, and undertakes to give the body the most graceful as well as the most adhesive position in the saddle. These exercises, which are protracted through a great number of lessons, are commenced upon the ground, continued upon a horse standing still, and completed upon horses in movement. The object of the teacher is so to train the pupil that he shall possess at once a perfect balance and as much cling as is possible with long stirrups. Upon this part of his system however M. Baucher has written very

briefly, having devoted his pen mainly to the science of training horses for the saddle.

HORSE CHESTNUT (*æsculus*, Linn.), a tree of the natural order *æsculaceæ*, comprising a large number of species, of which the most common and best known is *Æ. hippocastanum* (Linn.), a handsome tree, with broad, digitate leaves, and spikes of handsome flowers, the corollas white, spotted with crimson and yellow, cultivated for ornamenting parks and streets. This species is supposed to be a native of Asia, and has passed through Europe to America. Its exact habitat has never been ascertained. There have been at least two varieties, one with blotched yellow or yellowish white foliage, not however very handsome, and the other with double flowers. The tree has been sometimes known to grow to the height of 80 feet, though ordinarily it does not attain to more than 40. Its wood is soft and of little value; its bark is astringent, and abounds in tannin; its fruit contains much starch, and has been used in fattening cattle, and given to horses afflicted with colds and coughs. From this circumstance, or else from its large size, it has received its common name. It is unfit for the food of man. The nuts germinate freely, and penetrate the soil at once, by means of a strong tap root. The extremity of this is sometimes broken off before they are set out, or sown after germination, thereby insuring the growth of more lateral roots. If, however, large trees are desired, it is best to allow the tap root to descend as it will, in quest of aliment and moisture. The fruit of the horse chestnut consists of its polished seed covered with a thick husk that divides into several segments before it falls. In some species this husk or envelope is covered with prickles or spines, and in others its surface is perfectly smooth. To the first of these kinds belongs the common Asiatic horse chestnut, and the Ohio buckeye (*Æ. glabra*, Willd.). The latter is a smaller tree, with flowers having pale yellow inelegant corollas, growing on river banks, in western Pennsylvania, Kentucky and Ohio; its bark exhales an unpleasant odor, and its fruit is not half the size of the common horse chestnut. To the second kind, with smooth or unarm'd fruit, belongs the small-flowered buckeye (*Æ. parviflora*, Walter), a small dwarf shrub, blooming in July and bearing numerous flowers on long spikes which impart an agreeable perfume. It is a valuable addition to the shrubbery. A specimen in cultivated ground, 12 years old and 8 feet high, has attained a spread of foliage 60 feet in circumference, and others nearly as much. The red buckeye (*Æ. pavia*, Linn.) is an ornamental species, cultivated for the beauty of its flowers, which both in calyx and corolla are of a bright red; it is a small tree growing spontaneously from Virginia to Arkansas. The *Æ. discolor* of Pursh is only a variety of the sweet buckeye (*Æ. flava*, Aiton), a large tree with pale yellow blossoms, occurring in rich woods from Virginia to Indiana and southward, where, according to Elliott, it assumes the size

of a shrub 4 to 6 feet in height. The process of cross impregnation between those species whose flowers are quite diverse, has enabled gardeners to produce from seeds many new, curious, and ornamental varieties, both in style of foliage and in deeper shades of the flowers. All species of the horse chestnut family are easy of cultivation, and are much admired.

HORSE FLY. See *DIPTERA*, genus *tabanus*.

HORSE MACKEREL. See *TUNNY* (American).

HORSE POWER, in machinery, a measure by which the capacity of engines is rated, established by Boulton and Watt at 33,000 lbs. raised one foot high per minute. On this basis Watt reckoned the force of his steam engines, and the term has continued in use for want of a better. It is unsatisfactory when applied to a steam engine, as it is apparent that the power of the machine varies with the pressure of steam employed. A small steam cylinder of great strength furnished with abundant boiler room may be made to do the work of a much larger engine with little boiler capacity; and it may also be objected to the use of the word, that it has no reference to the quantity of fuel the engine may consume in working up to the power named. The expression is moreover defective, inasmuch as the work of a horse does not continue in action, as may that of the engine, but is interrupted at intervals of a few hours, the length of which varies with the force exerted. Boulton and Watt allowed in their estimate 8 hours as the period of work for the horse. If the measure then is regarded as any thing more than a mere conventional unit and as suggesting an actual comparative estimate, the power of the engine, continuing throughout the 24 hours, should be called 3 times as great as the number commonly assigned to it. Computations that have been made by different engineers of the average power of horses differ greatly in their results. This is to be expected in consequence of the various modes in which their strength is applied, of the various rates of speed (the effective force rapidly decreasing with the increase of speed), and also of the different qualities of the horses. Watt based his calculations upon the work of the powerful draught horses employed at the London breweries. D'Aubuisson estimated the work done by average-sized horses in whims or hoisting machines at the mines at Freiberg, working 8 hours in 24 in two relays of 4 hours each, amounting to 16,440 lbs. raised one foot high per minute, less than half the result of Watt's calculations; while Desaguliers made an estimate of 44,000 lbs., under similar circumstances as to the duration of work. Smeaton's estimate was 22,000 lbs., and Tredgold's 27,500. Different formulæ are given for computing the horse power of engines, but they may be reduced to the simple rule of multiplying the effective pressure upon the piston in pounds per square inch by the velocity of the piston in feet per minute, and dividing by 33,000. (See

STEAM ENGINE.)—Horse power is also a name given to various machines contrived to be worked by horses. The common horse whim in use at mines is one of these. It consists of a large drum upon a vertical shaft, which is turned round by horses attached to its horizontal arms. The drum is elevated sufficiently for the horses to pass under the rope, which is wound and unwound by its revolutions. Similar machines are made of cast iron in portable forms, by which toothed wheels or belts are made to drive other machinery. Upon ferry boats the horse power has usually consisted of a revolving circular platform, upon which the horse, generally a blind one, travels, pushing this round under his feet as he draws upon the traces, which are fastened to a fixed object. For turning a circular saw for sawing wood, machines are in use in which the horse works upon a narrow platform, that is supported by endless chains, and is carried round two drums; the chains are also supported upon friction rollers.

HORSE RADISH (*cochlearia armoracea*), a plant of the natural order *crucifera* or *brassicaceæ*. Its root is perennial, and its stem round and smooth, rising to the height of 2 to 3 feet from the midst of numerous large radical leaves. The stem supports smaller leaves and clusters of white flowers, which bloom in June. The pod is small, of elliptical form, 2-celled, and contains 4 to 6 seeds. The plant was brought from Europe, and is cultivated in gardens for the sake of its root, which is used as a condiment, and also to some extent as a medicine. It has when freshly scraped a hot, biting taste, and a pungent odor. It is highly stimulating in its effects, promoting the secretions and invigorating digestion. These qualities have led to its occasional use as a medicine in dropsical complaints, chronic rheumatism, &c. Applied externally, the grated root acts as a rubefacient.

HORSE SHOE, a strip of iron bent around in the form of the hoof of the horse, and fastened upon the bottom of the same by nails driven through the outer corneous layer, and clinched upon the outside. An additional security is sometimes given to it by turning up a piece of iron welded to the front part of the shoe and fitting this closely into the toe of the hoof; this serves also still more to protect the hoof from wear. For use upon icy roads, the shoes are provided with steel points called corks, one at each heel of the shoe and one at the toe. Oxen also are furnished with iron shoes, each of which is made, on account of the cleft in the foot, in two parts, shaped to fit the bottom of the hoof. The need of such a protection to the feet of the horses and mules employed in war was greatly felt by the ancients, and the value of sound and strong hoofs was much more appreciated by them than by the moderns. Xenophon, Vegetius, and other authors gave certain methods of rendering the hoofs harder; but no clear intimation is anywhere to be found that either the Greeks or Romans made a practice of shoeing horses to protect their hoofs

from wear. In several military campaigns the cavalry were rendered useless, and the horses were sent away till their hoofs could be restored. Camels were sometimes provided on long journeys and in war with leather coverings for the feet, and Aristotle calls these by the same name in use for the socks or soles of ox-hide worn by the common people. The feet of oxen also were protected when injured by a sort of bandage woven or plaited with the fibres of plants. In the life of Nero by Suetonius it is stated that this emperor on short journeys was drawn by mules which had silver shoes, and some of the mules also had shoes of gold. These evidently were not of the class of shoes intended for wear, but must have been merely an ornamental cover for the upper part of the hoof. The Japanese have long used straw shoes or socks to protect the feet of horses travelling on stony roads. These are rapidly worn out, but are everywhere easily replaced at little cost. Beckmann is of opinion that modern horse shoes when first introduced were known by the Greek name *σεληνια*, from their moon shape; and the earliest use of this that he could discover was in the works of the emperor Leo of the 9th century. It is expressly stated that these are made of iron, and that nails belong to them. Horse shoeing is supposed to have been introduced into England by William the Conqueror. Henry de Ferres or Ferrers, who came over with him, is supposed to have owed his surname to his office of inspector of farriers; upon the family coat of arms are 6 horse shoes. In the graves of some old Germans and Vandals of unknown antiquity in the northern countries, Beckmann states that horse shoes have been found with other horse furniture.—Horse shoes have long been the subject of a singular superstition. They were thought to be a protection against evil spirits and witches, preventing these from passing the threshold at which one was nailed. Aubrey in his "Miscellanies" states that in his time (the latter half of the 17th century) most of the houses of the west end of London were thus protected. Horse shoes were always made by hand until the introduction of the machines invented by Henry Burden of Troy, of which mention is made in the notice of his life in this work. Horse shoe nails by a late American invention are now produced by machinery, and their manufacture by this improved method has recently been introduced into Birmingham and upon the continent of Europe.

HORSFIELD, THOMAS, an English traveller and naturalist, born in the latter part of the 18th century. He went to Java in 1802 under the auspices of the Dutch colonial government, and remained there during its temporary occupation by the East India company until 1817. After having thoroughly studied the natural history of the island, he returned to England with a large collection of animals and plants. The former are described in his "Zoological Researches in Java and the Neighboring Islands" (1821-4). His plants, which he had committed

to the care of the late Robert Brown of the British museum, were described by that gentleman, assisted by Mr. I. I. Bennett, in a work entitled *Plantæ Javanicæ*, &c.

HORSLEY, SAMUEL, an English prelate and mathematician, born in St. Martin's-in-the-fields in 1733, died in Brighton, Oct. 4, 1806. He was educated at Oxford, and after taking orders in 1759 held successively several important livings. In 1788 he was made bishop of St. David's, in 1793 of Rochester, and in 1802 of St. Asaph. For this rapid and unusual preferment he was in part indebted to his controversy with Dr. Priestley on the divinity of Christ, in which he displayed vast learning and great ability as a writer. In 1769 he published an edition of Apollonius Pergæus, and in 1775 an edition of the works of Newton. From 1773 he was for several years secretary of the royal society. Among his works were: a "Critical Dissertation on the 18th Chapter of Isaiah;" "Hosea, a New Translation, with Notes;" a "Translation of the Psalms;" "Biblical Criticism;" elementary treatises on mathematics; essays on the prosodies of the Greek and Latin languages; and numerous papers in the "Philosophical Transactions." His theological works have been collected and published in 8 vols. 8vo.

HORTENSE, QUEEN. See BEAUMARNAIS, HORTENSE EUGÉNIE.

HORTENSIVS, QUINTUS, a Roman orator, born in 114 B.C., died in 50 B.C. At the age of 19 he made a speech in the forum, and gained the applause of the orators Crassus and Scævola. He joined the side of Sylla in the civil war, and afterward was a constant supporter of the aristocratic party. When Cicero first came to the forum Hortensius was called the *rex judiciorum*. Though professionally rivals, they seem to have lived on friendly terms; and in the beginning of the *De Oratoribus Claris*, Cicero pays an eloquent tribute to the memory of Hortensius. When obliged to leave the city on account of the impeachment of Clodius, however, Cicero was bitter against the supposed duplicity of Hortensius, and it was not till some time after his return that he was convinced of the injustice of his suspicion. In 81 B.C. Hortensius was made quaestor; in 75, ædile; in 72, prætor; and in 69, consul, with Q. Cecilius Metellus. The year before his consulship occurred the trial of Verres, in which the two rival orators were opposed. After his consulship, Hortensius took an active part in the support of the optimates against Pompey, opposing the Gabinian law, which gave Pompey the control of the Mediterranean sea, and the Manilian law, which transferred to his command the army against Mithridates. Cicero subsequently joined the same party, and we find them pleading often in common. They defended together C. Rabirius, L. Murena, and P. Sylla. In 60 B.C. Hortensius withdrew from public life. He had acquired great wealth, and owned villas at Tusculum, Bauli, and Laurentum.

HORTICULTURE, the most perfect method

of tilling the earth so as to produce the best results in the form of fruits, food, and objects of beauty from the vegetable kingdom. Horticulture or gardening has been pursued from the earliest times of civilization or national refinement. Among the Romans, according to Pliny, small gardens filled with roses, violets, and other sweet-scented flowers, were in repute; while many of the choicest plants and flowers which we now cherish were cultivated by the ancient Greeks. Horticultural art declined, however, with the fall of Rome, and not until long after did it revive under the monastic institutions. A part of the policy of Charlemagne was the establishment of gardens by royal edict, prescribing the very plants which were to be grown. In the 16th century several botanic gardens were founded by Alfonso d'Este, duke of Ferrara, and in consequence many other noblemen had fine gardens of their own. The Venetians and Paduans followed the example, and in 1555 a garden founded at Pisa by Cosmo de' Medici had become so rich in plants as to excite admiration. The garden at Montpellier in France, founded by Henry IV., contained before the end of the 16th century upward of 1,300 French, Alpine, and Pyrenean plants. At this time the garden at Breslau in Germany, to which the celebrated botanist Fuchs was attached, was in existence; and in 1577, at the suggestion of Bontius, was founded the garden at Leyden. In England, pleasure gardens with fountains and shady walks, with hedges and designs, were known from the time of the conquest, but it was not until the construction of conservatories for the preservation of tender plants that much more progress had been effected. According to London, it was not until 1717 that such structures were furnished with glass roofs, and from this time a new era in gardening began. The education and training of young persons to the practice of gardening raised the occupation to an art, and has brought English horticulture to a high rank.—We have considered horticulture as the acme of agriculture; and accordingly we shall not be surprised to find how productive land can be made when husbanded by practical gardening. Vegetation is increased by means of abundance of manuring, tillage, and supply of moisture. In some districts and countries the latter has to be artificially applied by irrigating processes; but when this is not considered expedient, the deep ploughing, digging, or spading of the earth, and plentiful manuring, with careful weeding, will allow a great diversity of crops upon the same area. In the United States, a liberal policy has stimulated horticulture by premiums. State and county and town horticultural societies have also been instituted, and within the last 25 years an extraordinary change in gardening has been perceptible. Indeed, in every department of horticulture there has been a steady advance, promotive of a correct taste and of an appreciation of beauty, in buildings, grounds, and ornament, and in an

increasing love for trees and flowers; and a literature pertaining to the science and practice of horticulture has sprung up, establishing a system specially adapted to the climate and wants of the country. Valuable treatises upon fruit, as well as manuals for the raising of flowers, with magazines and journals containing communications of different methods, mark the direction of the public taste. Of these, the following are some of the most important: "New England Farmer" (Boston), a weekly journal devoted to agriculture and gardening, commenced in 1823; the "New American Gardener," by Thomas G. Fessenden (12mo., Boston, 1828); "Transactions of the Massachusetts Horticultural Society" (1829-'37, and 1847-'52); "Magazine of Horticulture, Botany, and all Useful Discoveries and Improvements in Rural Affairs," by C. M. Hovey (Boston), a monthly journal commenced in 1835; the "American Flower Garden Companion, adapted to the Northern States," by Edward Sayers (12mo., Boston, 1838); Buist's "Flower Garden Directory" (Philadelphia, 1839); the "Theory of Horticulture," &c., by John Lindley (American edition, with notes by A. J. Downing and Asa Gray, 12mo., New York, 1841); "Treatise on the Theory and Practice of Landscape Gardening, adapted to North America," by A. J. Downing (New York and London, 1841-'8), with a supplement by H. W. Sargent (New York, 1859); "The Young Gardener's Assistant," by Thomas Bridgeman (10th ed., 8vo., New York, 1844); "The Horticulturist," edited successively by A. J. Downing, P. Barry, and J. Jay Smith (New York), a monthly journal, commenced in 1846; "The Fruits of America," by C. M. Hovey, with colored plates (2 vols., and 2 numbers of vol. iii., 4to., Boston, 1847-'59); "Fruits and Fruit Trees of America," by A. J. Downing, revised by Charles Downing (8vo., New York, 1859); "The Gardener's Monthly and Horticultural Advertiser," Thomas Mehan, editor (Philadelphia, 1859).

HORTUS SICCUS. See HERBARIUM.

HORVÁTH, MIHÁLY, a Hungarian historian, statesman, and bishop of the Roman Catholic church, born at Szentcs, county of Csongrád, in 1809. He became professor of the Hungarian language and literature at the Theresianum of Vienna in 1844, bishop of Csanád in 1848, and as such member of the upper house of the diet, and in 1849, after the declaration of independence at Debreczin, minister of state for public worship and education in the Szemere ministry. The fall of the revolution made him an exile, and he has since resided alternately in France, Switzerland, and Belgium. His principal work is *A Magyarok Története* ("History of the Hungarians," 4 vols., Pépa; German translation, Pesth, 1850-'52), which is regarded as the most accurate and impartial history of his nation.

HOSACK, DAVID, M.D., LL.D., an American physician and author, born in New York, Aug. 31, 1769, died Dec. 23, 1835. His father, Alexander Hosack, was by birth a Scotchman. David, after attending school in Newark and Hacken-

sack, entered Columbia college in 1786, in 1788 proceeded to Princeton college, and was there graduated in 1789. While in attendance in the freshman and sophomore classes in Columbia college he was also engaged in the study of medicine and surgery with Dr. Richard Bayley. The medical faculty of Columbia college having been broken up by the war of the revolution, and no collegiate organization then existing to confer medical honors on its students, young Hosack repaired to Philadelphia, where he received the degree of M.D. in 1791. At the recommendation of Dr. Rush he commenced the practice of physic in Alexandria, Va.; but after somewhat more than a year's trial he returned to New York. With a view to further medical studies, he set out for Edinburgh, where he became acquainted with Dugald Stewart, Beattie, Henry Mackenzie, Principal Robertson, the poet Burns, and Hugh Blair. We next find Dr. Hosack in London about the close of 1793, a pupil in the study of anatomy under Dr. Andrew Marshall, in the study of the practice of physic with George Pearson, with Curtis and Sir James Edward Smith on botany, with Abernethy and Sir James Earle on surgery, and with Schweisser, a pupil of Werner, on mineralogy. From this last named teacher he obtained a cabinet of minerals which he brought home upon his return to his native land, as the first collection of that nature introduced in America; and to this cabinet of natural science he had added a collection of the duplicate specimens of plants from the herbarium of Linnæus, procured through the instrumentality of the president of the Linnæan society of London. This interesting collection of dried plants gathered by Linnæus himself now constitutes a part of the museum of the lyceum of natural history of New York. While in London Dr. Hosack wrote for the "Annals of Medicine" a paper on the communication of the virus of small pox to the fœtus *in utero*, and one on vision, in which he was the advocate of the theory that the eye adapts itself to the view of objects at different distances by means of its external muscles. This was printed in the "Transactions of the Royal Society" in 1794. Young about that time had attributed that power of accommodation to the muscularity of the crystalline lens, and this vexed question gave origin to several other papers in the "Transactions." He returned to New York in 1794. In 1795 he was appointed professor of botany in Columbia college, and soon after published a syllabus of his lectures. In 1796 he formed a partnership with Dr. Samuel Bard, which lasted until 1800, when Dr. Bard retired. On the death of Dr. William P. Smith the chair of materia medica was assigned to Dr. Hosack, who held it with that of botany until 1807, when he accepted the department of materia medica and of midwifery in the newly created school established by the regents, the college of physicians and surgeons, under the presidency of Nicholas Romaine. This new school being remodelled in 1811, under the presidency of Dr. Bard, he was appointed professor of the theory

and practice of physic and clinical medicine, to which were afterward added obstetrics and the diseases of women and children. He retained his post after the union of the two rival medical faculties of Columbia college and the college of physicians and surgeons in Sept. 1813. The anomalous government of the institution, however, led to many feuds and embarrassments between the trustees and professors, which ultimately caused the resignation of the entire faculty in 1826. Drs. Hosack, Mott, Macneven, and Francis determined to organize another medical institution, and accordingly obtained from Rutgers college, at New Brunswick, N. J., such rights as would enable them to grant degrees. The Rutgers medical department went into operation in the autumn of 1826 under that authority, and subsequently received similar powers from Geneva college, N. Y. After 4 years, however, the Rutgers medical school ceased its functions. Legislative enactments interposed, and the faculty was dissolved. Dr. Hosack held at different times several public trusts, as physician to the almshouse, the New York hospital, and the Bloomingdale asylum, resident physician of the city of New York, &c. He was long associated with the prominent public characters of New York, and was among the original projectors of the New York historical society, of the horticultural society, and of the New York literary and philosophical society. He early supported the formation of the library of the New York hospital. His great enterprise, the establishment of the Elgin botanic garden, gives evidence of his spirit in advancing the taste and culture of natural knowledge; but the undertaking failed. His *Hortus Elginensis*, a scientific catalogue of the collection of plants indigenous and exotic which he had brought together, is sufficient to give him a high position as a botanist. He was a devoted physician, with great clinical skill; in seasons of pestilence he was foremost among those most ready to penetrate into the causes of endemic and epidemical disorders, and suggest the best means of relief. He was enrolled a fellow of the royal society of London, and in 1817 of the Edinburgh royal society. He proscribed politics as being without the bounds of a medical life; and yet such was his devotion to works of public importance in the arts, science, and humanity, that it became almost a proverb that the great institutions of the city were mainly under the control of the memorable trio, Clinton, Hosack, and Hobart. His writings are chiefly on medical subjects, and of a practical nature. He wrote most abundantly on fevers, and on that type denominated yellow fever. He was a strenuous supporter of the foreign origin of the disease, and of its communicable character, *sub modo*. His paper on the laws of contagion and of contagious disorders obtained a wide celebrity. In 1810, in conjunction with his pupil John W. Francis, afterward his associate in business for many years, he projected a new medical journal, entitled the "American Medical

and Philosophical Register," which was continued 4 years. Among his other works may be mentioned: "A Biographical Memoir of Hugh Williamson, M.D., LL.D." (8vo., 1820); "Essays on Various Subjects of Medical Science" (3 vols. 8vo., 1824-'30); "System of Practical Nosology" (8vo., 1829); "Memoirs of De Witt Clinton" (4to., 1829); "Lectures on the Theory and Practice of Physic," edited by the Rev. H. W. Ducachet, M.D. (8vo., 1838).

HOSANNA (Heb., save, we pray), in Jewish antiquity, a form of acclamation on joyous and triumphal occasions. At the feast of tabernacles it was customary to sing Ps. cxviii. 25, 26, which begins with the word hosanna, while the people carried green boughs of palm and myrtle. From this circumstance the boughs and prayers were called hosanna, and the 7th day of the feast the great hosanna. The term was employed as a triumphal salutation to Christ (Matt. xxi. 9), on his public entry into Jerusalem.

HOSEA, the first of the minor prophets, supposed to have commenced his prophecy about 780 B. C., and to have exercised his office at intervals for about 60 years. Most of his prophecies are directed against the children of Israel, rebuking and threatening them for their sins, and exhorting them to repentance. His style is concise, sententious, and abrupt; and his prophecies are in one continued series, without any distinction as to the times when they were delivered or the subjects to which they relate.

HOSIUS, **STANISLAS**, a Polish prelate, born in Cracow, May 5, 1504, died in Caprarola, near Rome, Aug. 5, 1579. He studied law at Padua and Bologna, and had been employed in important political affairs in Poland before he received holy orders. He was soon raised to the episcopate, and distinguished himself by his opposition to Protestantism. The Catholic faith in Poland was often called from him the Hosian faith. He was legate of the pope at the council of Trent; in 1561 he was made cardinal; in 1564 he founded the first college of the Jesuits in Poland; and he was afterward invited by Pope Gregory XIII. to Rome. He published in 1551 a confession of faith, which was translated into most of the European languages, and his *Opera Omnia* (2 vols.) appeared at Cologne in 1584.

HOSMER, **HARRIET**, an American artist, born in Watertown, Mass., in 1831. Being of a naturally delicate constitution, she was encouraged by her father, a physician, to pursue a course of physical training at variance with the usages of her sex, but which she adopted with enthusiasm. At a comparatively early age she was an adept in shooting, swimming, rowing, riding, skating, and other out-of-door sports, and began also to give much attention to modelling figures in clay. Having completed her school education, she studied anatomy for some months with her father, and in the autumn of 1850 repaired to the medical college

of St. Louis, where she went through a regular course of anatomical instruction, preparatory to attempting sculpture. In the summer of 1851 she returned home, and commenced her first original work, a bust of "Hesper," which, upon its completion in marble in the succeeding year, attracted much attention in Boston, and encouraged her father to place her under a competent master in Rome. Upon arriving in that city late in 1852, she almost immediately gained admittance as a pupil to the studio of Gibson the sculptor, and passed her first winter in modelling from the antique. Her busts of "Daphne" and "Medusa" were the first fruits of her attempts at original design in Rome, and were followed by a statue of "Enone" for a gentleman in St. Louis. For the public library of the same city she also executed her best known work, the reclining figure of "Beatrice Cenci," which has won many encomiums from art critics in Europe and America. In the summer of 1855 she modelled a charming statue of "Puck," the popularity of which has procured her orders for several copies, one of which is for the prince of Wales and another for the duke of Hamilton. Pecuniary reverses having overtaken her father, she determined to rely entirely upon her art for a support, and is now permanently established among the professional sculptors of Rome, where, with the exception of a single visit to America in 1857, she has continued to reside. Among her more recent works are a full-length reclining figure of a young girl for a funeral monument in the church of Sant'Andrea della Fratte in Rome, a fountain with figures illustrating the myth of Hylas and the water nymphs, and a "Will-o-the-Wisp," designed as a pendant to "Puck." In the latter part of 1859 she finished a statue of "Zenobia in Chains" as she appeared in the triumphal procession of Aurelian, a work on which she had labored enthusiastically for nearly two years previous, and the execution of which in marble so seriously impaired her health that her physicians sent her to Switzerland to save her life. It is of colossal size, and has been pronounced by far the best of her works.

HOSMER, **WILLIAM**, an American clergyman, born in Brimfield, Mass., May 29, 1810. He spent some time in the Franklin academy, Prattsburg, N. Y., but his education was obtained mostly by private study. He entered the ministry of the Methodist Episcopal church in 1831, and became a member of the Genesee conference. He filled some of the most important stations in the conference, and served a term as presiding elder. For 8 years he was chosen by the general conference editor of the "Northern Christian Advocate," published at Auburn, N. Y., of which paper he had been corresponding editor for several years previous. He is at present editor of the "Northern Independent." He is the author of "Self-Education, or the Philosophy of Mental Improvement," "Principles of Female Education."

"The Higher Law," and "Christian Beneficence," beside numerous articles in quarterly reviews and other periodicals. The paper which he edits is the advocate of changes in the Methodist Episcopal church, but particularly that which relates to slavery, urging the adoption of a rule of discipline which will prohibit slaveholding by the members of that church.

HOSMER, WILLIAM HENRY CUYLER, an American poet, born in Avon, N. Y., May 5, 1814. He studied first at Temple Hill academy, Geneseo, and subsequently at Genesee college. He had at this period acquired such a reputation by his poems as to have the degree of M.A. conferred upon him by both Hamilton college and the university of Vermont before he received it from his own *alma mater*. He afterward studied law, and succeeded the late Hon. John Young as master in chancery. In 1836 he travelled extensively in Wisconsin, where he studied the Indians who were then almost the sole inhabitants of the territory; and during 1838-'9 he had opportunities of observing the peculiarities of the southern aborigines while visiting for his health the everglades of Florida. In 1854 he removed to the city of New York, where he has held for some time an office in the custom house. His principal works are: "The Fall of Tecumseh" (New York, 1830); "Yonondio, or the Warriors of the Genesee" (1846); "The Months," "Bird Notes," "Legends of the Senecas," and "Indian Traditions and Songs" (1850). A complete collection of his "Poetical Works" appeared in 1853.

HOSPITAL, a public institution for the relief of the sick and infirm. The ancients took little public care of these classes of persons. The *hospitalia* of the Romans were intended, not for invalids, but solely for the accommodation of guests. More attention was bestowed upon the infirm by the early Christians, although the hospitals founded under their auspices were not, like most of the modern institutions, exclusively places of refuge for the sick, but for all kinds of persons in distress. A famous institution of the kind was founded in Cæsarea in the latter part of the 4th century. The next notable hospital was that of St. Chrysostom, built at his own expense in Constantinople. One of the finest hospitals of Rome was founded by Fabiola, a Roman lady, the friend of St. Jerome. The pilgrimage to holy places led to the establishment of many places of refuge or hospitals for travellers. St. Jerome built such a hospital at Bethlehem, and his friend Paula several on the road to that village. The Scots and Irish founded several in France for the benefit of their countrymen who might pass through that country on their pilgrimage to Rome. Many were built in mountainous, desolate, or dangerous localities, where travellers stood most in need of them. The *hôtel Dieu* in Paris is said to have been founded in the 7th century. In the 9th century there were 24 hospitals in Rome alone. In the 11th century brotherhoods for the relief of sick pilgrims were formed in the Holy

Land; they increased in number and wealth during the progress of the crusades. The hospitals in Palestine then afforded better accommodation than any other institutions of the kind, and many persons, on returning to their own countries, took them as models for similar establishments. In the hospitals at Jerusalem the knights and brothers officiated as physicians, although their medical knowledge was limited. Hospitals intended for the sick alone do not seem to have been generally established before the 11th century, although a few may probably have existed at an earlier period. Lanfranc, archbishop of Canterbury, caused a hospital to be built there in 1070, with separate departments for men and women. Since that time hospitals have been established in all civilized countries, and they are now to be found in almost every town, while large cities contain a number of them. There are general hospitals for all kinds of invalids excepting those infected with contagious diseases, and special hospitals for the accommodation of patients laboring under diseases of a sufficiently frequent occurrence to authorize the establishment of a special institution for their treatment. One of the earliest hospitals for invalid soldiers was founded in Constantinople by Alexius Comnenus in the 11th century. The most celebrated hospitals for invalid soldiers at the present day are the *hôtel des invalides* in Paris and Chelsea hospital in England. Field hospitals or flying hospitals were known as early as the 6th century, and perhaps at a much earlier period. (See AMBULANCE.) The exertions of the clergy and many benevolent women have had a great influence in the promotion of these institutions.—Hospice is the name given to the places of refuge for travellers in the passes of Mt. St. Bernard, St. Gothard, the Simplon, and other great mountains.

HOT SPRING, a central co. of Ark., drained by Sabine and Washita rivers; area, 1,020 sq. m.; pop. in 1854, 3,654, of whom 423 were slaves. It has a hilly or mountainous surface. Excellent oil stone is found in the county, and is exported to all parts of the United States; and magnetic iron ore is so abundant in a certain locality that the land, it is said, cannot be surveyed with a compass. Hot and mineral springs exist in considerable numbers, the most noted of which are at Hot Springs, the capital, 6 m. from the Washita river. There are 35 here, the temperature of which varies from 135° to 160°. The soil of the county is very fertile in the river bottoms. The productions in 1854 were 173,488 bushels of Indian corn, 6,197 of wheat, and 16,301 of oats. There were 3 saw mills, 1 grist mill, and 309 pupils attending public and private schools.

HOTBED, in gardening, a bed of earth so prepared as to bring forward at early periods of the year various kinds of plants by means of artificial heat. The fall of temperature in autumn is met by the readiness of plants to fall into repose, and in those used to climatic changes

no serious effect can be produced. Such, however, as are not acclimated cease to grow during any fall in the usual temperature, and commence again on its rise. Unlike animals, plants have very little power to generate heat, and are therefore dependent on the media which surround them for whatever degree of warmth they require. The earth may be heated many degrees more than the surrounding air, and yet prove in no way injurious to vegetation. The unusual vigor of plants growing near hot springs, and in places artificially heated by subterranean fires, is also worthy of attention. A species of moss, the only living thing found within 4,000 feet of the terminal crater of Mauna Loa, was noticed by Wilkes; its existence there being due to the steam which escaped, and which supplied it with warmth and moisture. This heated condition of the soil, thus natural to seasons and to regions of the globe, would suggest what is called bottom heat in gardening. Many seeds, especially those of tropical plants, will not germinate unless in more than ordinary temperatures of the earth, and to excite them some kind of stimulus is requisite. It is not an unusual practice in America to sow such seeds in midsummer in the open ground, which becomes so heated by the rays of the sun as to retain much of the warmth during the entire night. The hotbed, then, is a provision by which a constant and gentle warmth is maintained; and the external structure, which preserves this warmth, is called the frame. Many tropical plants will neither flower nor grow unless they are surrounded by an elevated atmosphere, and are planted in such heated soil as they are accustomed to; and the same holds true with many aquatic plants. Meyen found the temperature of the water in the rice fields where the red nelumbium flourishes to be 113°. Hence the hothouse or stove is erected for their special accommodation, and by a system of hot-water pipes or some similar contrivance the required heat is procured. The hotbed differs from the stove, however, in having the space between the sash and the surface of the bed very shallow, and in having its heat maintained by fermentation. The work of the gardener in the early spring months is directed to the hotbeds or frames, and in these he forces such vegetables as he wishes to have prematurely fit for the table. The art of framing or management of the hotbed depends much upon the accuracy and care taken in its construction. The ground where it is to stand should be defended from cold and cutting winds, and enclosed by a tight and well-built fence, or by live hedges. The frame can be made of any suitable material, but should be so constructed as to give the top surface a proper slope to the sun, as well as a declivity to carry off the wet when covered with the sashes or lights. It is essential that they be made as tight as possible, so that none of the warm air from within or cold air from without shall penetrate through cracks. On this declivity or slope the sashes should be laid, and in such a

way that they can easily move or slide from top to bottom. The bed that is to be covered by such frames must be composed of good horse-stable dung, selecting that which is fresh, moist, and full of heat. After a sufficient quantity of such is procured, it should be forked into a heap, so as to mix it well, and allowed to remain 8 or 10 days to ferment equally; a necessary precaution lest the bed become too hot and thereby destroy the germinating seeds. At the end of this period, the dung should be shaken and mixed, and formed into a bed 4 feet thick, beating it down firmly with the back of the fork. It is calculated that this thickness will be diminished by settling at least 8 inches in a fortnight, when the frame and sashes are to be put on and kept closed until the heat comes up, when the glass is to be raised behind to allow the steam to pass away. This accomplished, the manure is to be covered with soil, which has been previously prepared in the form of compost, of equal parts of light, rich garden earth, the mellow surface loam of old pasture ground, and a portion of very rotten or old horse dung. This, having been well incorporated and exposed to the weather for several months before, is to be spread to the thickness of about 6 inches in a level manner, when the hotbed is ready for use. The seeds of most vegetables are sown in drills upon this compost, those of melons and cucumbers in small pots which are plunged into the soil. After the seeds are sown and the sashes are closed, the heat of the bed raises much steam from the moisture beneath; this should be suffered to escape by raising the corner of the upper end of the sashes. An hour before sunset the sashes should be shut and covered with matting or with some suitable protecting substance; and this is to be taken off regularly an hour or so after sunrise. Great caution is requisite, in a climate like that of the northern United States, in order to keep up proper warmth and to exclude any frost. After the seeds have vegetated and the young plants have come up, the sashes should be raised a little in the day time, so as to admit fresh air; and if the surface of the bed appears to be dry, it should be moderately moistened with warm water of about the same temperature as that of the enclosed air of the frame. After a while the heat will sensibly diminish, when it is customary to line the exterior of the bed with fresh dung and cover these linings with litter.

HOTTENTOTS, a people of South Africa, the original inhabitants of the territory now occupied by the British colony of the Cape of Good Hope. The name Hottentot is of Dutch fabrication, and is supposed to have been given to the people by the first Dutch explorers of the Cape from the frequent occurrence in the native language of clicking sounds resembling the words "hot" and "tot," or, as the Dutch would say, *hot en tot*. The people call themselves *Quiquae*. Nothing whatever is known of their origin. They are unlike all other African races, and bear more resemblance to the Chinese or

to the Mongols than to the negroes, having broad foreheads, high cheek bones, oblique eyes, thin beards, and a yellow complexion. Their hair is harsh and wiry, and grows in distinct tufts about the size of a large pea. They are erect and well proportioned, and some of the women when young are beautifully formed, though after child-bearing they become hideously ugly. The hands, the feet, and the joints of both sexes are remarkably small. Their native dress consists of a strip of the skin of some animal tied round the waist, from which before and behind depends a sort of apron reaching to the middle of the thigh. In cold weather they wrap themselves in cloaks made of sheep skins, and in hot weather they protect their bodies from the sun and from insects by a liberal coating of grease. Within the bounds of the Cape Colony they are now tolerably civilized, and wear European clothing. They are a lively, good-natured, mild, and timid people, and manifest considerable intellectual powers. In their wild state they show great patience of hunger and thirst, being often reduced to severe straits for subsistence, and obliged to live upon roots, insects, and the pith of the palm tree. When freely supplied with animal food, they are glutinous to excess. Their native weapons are the *assagai* or javelin and the bow with poisoned arrows. Their only native arts were the manufacture of coarse earthenware, of their skin cloaks, of their weapons, and of a rude guitar with 3 strings, and a flute made of bark. Their dwellings were low, circular huts, made of rods stuck in the ground and covered with mats. These were arranged in a circle to form a *kraal* or village. They had herds of cattle and flocks of sheep, and showed considerable skill in the management of oxen. By the colonists they are now much employed as herdsmen and drivers. Their language is peculiar, and is remarkable for a strong clicking sound which is made by suddenly withdrawing the tongue from the teeth or palate; it has been compared to the noise made by a hen when she has laid an egg. Many of the words are exact imitations of the cries of animals, as, for instance, *kraak* is their word for frog, *mnoo* for ox, and *meau* for cat. Capt. Wilkes of the U. S. exploring expedition, who visited Cape Town in 1842, says of the Hottentots: "Those that we saw were remarkable for very high and prominent cheek bones and a sharp chin; they are not much inclined to steady employment; the tending of cattle, and the indolent and wandering life in which they pass their time, suit their disposition. They at times hire themselves out to the farmers, receiving cattle as wages. In the colony they do not bear a very high character for honesty and faithfulness. They are expert drivers of wagons, but are otherwise careless and inattentive. They are deemed an improvident race, though there are some instances of their showing great attachment to individuals who have treated them well. Their numbers are now variously stated; but little dependence is to be placed on the accounts

given, as is evident by their varying from 10,000 to 30,000." Dr. Prichard in his "Natural History of Man" says: "Although the wild tribes of the Hottentot race display ferocity and all the other vices of savage life, yet we have abundant proof that these people are not insusceptible of the blessings of civilization and Christianity. No uncultivated people appear to have received the instructions of the Moravian missionaries more readily than the Hottentots, or to have been more fully reclaimed and Christianized." Latrobe, one of the earliest of the Moravian missionaries in South Africa, who long resided there, says: "Whoever charges the Hottentots with being inferior to other people of the same class as to education and the means of improvement, knows nothing about them. They are, in general, more sensible and possess better judgments than most Europeans equally destitute of the means of instruction." The Hottentot race is found far beyond the limits of the Cape Colony, and is supposed to extend irregularly to a great distance in the interior. It was first made known to Europeans in 1509, when a Portuguese viceroy returning from India landed at the cape, and getting into a quarrel with the natives was killed with 70 of his men. The Dutch made a settlement at Cape Town in 1650, and reduced the Hottentots to slavery. They were emancipated by Great Britain in 1833.

HOTTENTOTS' BREAD, the popular name of the *testudinaria elephantipes* (Hérict.), an endogenous plant of the family *dioscoreaceæ*, and a native of South Africa. It presents a very odd appearance, a delicate vine-like stem, well furnished with rounded leaves an inch in diameter arising from the top and between the interstices of a large rough mass, divided into many-sided, deeply separated scales or plates, somewhat resembling those of a large tortoise (whence the scientific name); this is what botanists call a *rhizoma* or root stock, and is partly above and partly below the surface of the ground; the plates are only the dried rind or exterior surface, cracked and pushed outward by the interior growth; the roots proper grow from the lower surface of the central mass, which in the plants usually seen is about 1½ feet in diameter and more than a foot above the earth. The interior is soft, abounding in farinaceous matter, like the yams, to which family it belongs; it is eaten by the natives of the Cape of Good Hope. For the singularity of its appearance and the beauty of its foliage and flowers, it is occasionally seen in green-houses. For a further account of it, see "Burchell's Travels in South Africa," vol. ii.

HOTTINGER, or **HOTTINGUER**, JOHANN HEINRICH, a Swiss philologist and biblical scholar, born in Zürich, March 10, 1620, drowned June 5, 1667. He studied at Groningen, and afterward at Leyden, where he became teacher of the children of the orientalist Golius. In 1653 he was appointed to the chair of rhetoric, logic, and scriptural theology at Zürich. In 1655 he was permitted, at the request of the elector palatine,

to accept the professorship of eastern languages and biblical criticism at Heidelberg. On his return to Zürich in 1661 he was made rector of the university. His increasing reputation led to an invitation from the university of Leyden in 1667, which he was ready to accept, when, while crossing the river Limmath in the vicinity of Zürich, he was drowned by the upsetting of a boat, with several of his children. Among his works are: *Thesaurus Philologicus, seu Clavis Scripturæ*, a sort of introduction to scriptural studies (Zürich, 1644), and *Etymologicum Orientale, sive Lexicon Harmonicum Heptaglotton* (Frankfort, 1661).—The most eminent of his sons was JOHANN JAKOB, born Dec. 1, 1652, died Dec. 18, 1735, the author of *Helvetische Kirchengeschichte* (Zürich, 1708-'29). One of the latter's great-grandchildren, of the same name (born 1750, died 1819), was favorably known as an editor of several classical works, and as a writer of taste and ability.—Another member of the same family, JOHANN KONRAD VOX, born in Zürich in 1764, died near Paris, Sept. 11, 1841, was the founder of the banking establishment of Hottinger at Paris and Amsterdam. During the revolution he fled from Paris to America. Under the consulate he returned to France, and founded his banking establishment. He was a member of the council of the department of the Seine, president of the bank of France, colonel of the national guard, and stood at the head of the Reformed church in France.—The most noteworthy living member of the Hottinger family is JOHANN JAKOB, born May 18, 1783, in Zürich, where he officiates as a professor of history, and as a member of the board of education and of the government and town council. He is the author of a *Geschichte der Schweizerischen Kirchentrennung* (Zürich, 1825-'7), a continuation of Johannes von Müller's history of Switzerland.

HOUDIN, ROBERT, a French conjurer, born in Blois, Dec. 6, 1805. His father, a watchmaker, gave him a good education at the college of Orléans, and at 18 years of age placed him in a lawyer's office. Having had from boyhood an extraordinary taste for mechanics and ingenious amusements, he neglected his studies, so that his father, understanding that he could only make an indifferent lawyer, consented that he should learn watchmaking. While engaged in this occupation, the perusal of some works on natural magic and a friendship formed with a travelling conjurer inspired him with an inclination for juggling. Having married, he went to Paris and engaged in his trade, but soon became absorbed in mechanical wonders. He employed himself for a year in reconstructing an exceedingly complicated machine, and so overstrained his mind as to lose all mental power for 5 years. After recovering he devoted himself for some time, with great success, to making mechanical toys and automata, two of which attracted much attention. At the Paris exhibition of 1844 he obtained a medal for the ingenuity displayed in several curious figures of this kind. On

July 3, 1845, he opened the series of exhibitions in juggling which became so famous throughout Europe. His mechanical and scientific abilities, aided by study, enabled him to invent new feats, and these he performed in a simple and novel manner, avoiding the mountebank style of his predecessors. In 1848, the revolution having put an end for the time to the exhibitions of Paris, he went to England, where he performed before the queen and in many of the theatres with great success. He extended his exhibitions to other countries before returning to Paris. Here, in 1855 at the great Paris exhibition, he gained the gold medal for his scientific application of electricity to clocks, and shortly after relinquished his exhibition to his brother-in-law Hamilton, retiring with a fortune to Blois. In 1857 the French government, finding that the Arabs in Algeria were frequently stirred up to rebellion by the pretended miracles of their marabouts or priests, invited Houdin to visit that colony, and if possible excel the magicians in their own tricks. He completely succeeded, passing through several very singular adventures while so doing. In 1857 he published *Robert Houdin, sa vie, ses œuvres, son théâtre*, and in 1859 his *Confidences*, a most entertaining and curious work, an English translation of which has been edited by Dr. R. Shelton Mackenzie (Philadelphia, 1859).

HOUDON, JEAN ANTOINE, a French sculptor, born in Versailles, March 20, 1741, died in Paris, July 15, 1828. Having gained the first prize for sculpture in the royal academy at Paris, he visited Italy at a time when the excavation of Pompeii and Herculaneum, and the writings of Winckelmann, had given a new impulse to art. He passed 10 years in Rome in the study of the antique, and finished, among other works, the noble statue of St. Bruno in the church of S. Maria degli Angeli, of which Clement XIV. is recorded to have said: "It would speak, if the rule of his order did not prescribe silence." Returning to Paris, he executed during the next 15 years admirable busts of Rousseau, Diderot, D'Alembert, Franklin, Turgot, Mirabeau, Gluck, and many other distinguished men; statues of Voltaire and Tourville; the celebrated "Diana" for the empress of Russia; the *Frileuse*, and other works, which placed him in the first rank of French sculptors, and procured his admission to the academy. In 1785 he accompanied Franklin to the United States, to prepare the model for the statue of Washington ordered by the state of Virginia, and passed two weeks at Washington's residence at Mt. Vernon for that purpose. The statue, bearing the sculptor's legend, *Fait par Houdon, citoyen Français*, 1788, and which now stands in the hall of the capitol of Virginia at Richmond, is clad in the uniform of an American revolutionary officer, and, according to the testimony of Lafayette and other personal friends of Washington, is in many respects the best representation of him ever made. Among his later works were busts of Napoleon and Josephine and other celebrities

of the first empire, and the celebrated statue of Cicero in the palace of the Luxembourg.

HOUGHTON, a N. W. co. of the upper peninsula of Michigan, bordering on Lake Superior, indented by Keweenaw bay, and drained by Sturgeon river; area, 1,920 sq. m.; pop. in 1850, 708. It consists mainly of a peninsula called Keweenaw point, projecting into the lake. The surface is uneven and rocky. Copper is found nearly in a pure state, and several mines have been opened. Silver and iron abound.

HOUND (*canis sagax*), the name of several varieties of large and powerful dogs hunting by scent, and trained to pursue the stag, the fox, the hare, and other animals, and even man. The progenitors of the hound races were probably, according to Hamilton Smith, the jungle koola (*lyciscus tigris*, H. Smith) and the buansu (*canis primævus*, Hodg.), both of the warmer parts of Asia. (See DOG.) These were domesticated after the more wolf-like varieties, and display in all the breeds a tendency to the three colors of white, black, and tan, characterizing them in their wild state. The cranium has a larger cerebral cavity than in less sagacious dogs, with a more convex forehead, wider space between the eyes for the organ of smell, and broader jaws; most varieties have also a wide nose, full and prominent eyes, large hanging ears, a raised and truncated tail, and often a spurious toe on the hind feet. There are two races, the one with short hair, the hounds proper, and the other with long hair, like the setter and spaniel, and used as gun and water dogs; the pointer seems to occupy an intermediate place between them. The faculties which make the hounds so useful in hunting must have existed in the original species, and have been cultivated in regard to special game according to the fancy of man; the blood, stag, and fox hounds have no intuitive tendency to pursue respectively man, the deer, and the fox, and these only, but have been trained with great care to hunt a single game. The most ancient form of hound figured upon the Egyptian monuments resembles much the bloodhound, which was formerly so much esteemed for its sagacity, strength, and olfactory acuteness. The bloodhound, once employed to trace felons, enemies, and fugitives, or to bring the huntsman to the retreat of a wounded animal, has been fully described under that title; it is now kept in civilized countries rather for show than use; the height of the best breed is about 28 inches at the shoulder, the color tan with black clouds, and the expression of the face stern and noble. The stag hound is but little smaller than the bloodhound, and like it is slow, sure, and steady; in fact it is a mongrel bloodhound, the cross being either some greyhound or swift fox hound; it has a large, rather short and sharp head, long hanging ears, muscular limbs, small feet, and tail carried high; the color is always more or less white with fulvous markings. Stag hunting, as performed in the fatiguing and cruel manner of the 17th and 18th

centuries, is now rare, and this form of hound has become nearly if not entirely extinct. The fox hound of the present day is a perfect model of a hunting dog, and is a carefully bred cross between the bloodhound and the greyhound, probably with the intermixture of the southern English and perhaps other hounds; exactly how it has attained its present character it is impossible to determine. It is lower at the shoulders and more slenderly built than the stag hound, with shorter hair, and the color is white, with larger clouds of black and tan, one on each side of the head, covering the ears, another on each flank, and a third at the root of the tail. Its speed is such that none but a thorough-bred hunter can keep up with it, and its endurance so great that a pack has been known to run for 10 hours, tiring out 3 changes of horses, and severely testing the strength of the sportsmen. Breeders differ as to the best size for fox hounds, but from 22 to 24 inches high at the shoulder is generally considered the most advantageous. The best food is thought to be oat meal and well boiled horse flesh, attention being paid to their constitution, the season of the year, and amount of work to be done. The cry of a pack of hounds, once so cheering and melodious, has lost much of its romantic interest from the change man has effected in the character of these animals; the other good points of a hound, such as pureness of stock, beauty of form, speed, endurance, and acuteness of smell, are more highly prized in a pack than harmonious voices. The average value of an established pack of fox hounds may be set down at about £1,000, though some have been sold for more than twice that sum; single hounds are often sold as high as 100 guineas. (See BEAGLE, BLOODHOUND, DOG, GREYHOUND, and HARRIER.)

HOUR (Gr. *ὥρα*; Lat. *hora*), a measure of time equal to $\frac{1}{24}$ of a mean solar day, or this proportion of the period between sunrise and sunrise at the time of the equinoxes. Thus applied, it becomes a definite measure; but as employed by the ancients to designate $\frac{1}{24}$ of the natural day, it was an indefinite period, varying with the times of rising and setting of the sun, times which continually changed with the season, and between increasing extremes as the observations were made in higher and higher latitudes. Even in the latitude of Rome the length of the hour on June 25 was about $\frac{1}{12}$ part of 15 hours 6 minutes, as now reckoned, and on December 23 it was only $\frac{1}{12}$ part of 8 hours 54 minutes. At the two equinoxes only would the hour agree with its present measure. Hours thus divided were known as "temporary hours," in reference to their constant change of length. When the day was thus first divided is unknown. Herodotus states that the Greeks obtained the practice from the Babylonians. Wilkinson, however, states that "there is reason to believe that the day and night were divided, each into 12 hours, by the Egyptians, some centuries before that idea could have been imparted to the Greeks from Babylon." The division of the

night as well as of the day into 12 equal parts was not practised by the Romans until the time of the Punic wars, and the use of equinoctial hours was not adopted till toward the end of the 4th century; the first calendar known to have been made after this system is the *Calendarium Rusticum Farnesianum*. Hours are now reckoned in common practice in two series of 12 each, from midnight to midday, and from this to midnight, which corresponds to the supposed divisions of the ancient Egyptians. Astronomers count 24 hours from one midday to the next; and the Italians 24 hours from one sunset to the next, changing the commencement of the day with the season. In the early use of clocks in the 11th century it was the duty of the sacristans of the churches to regulate the *horologia* each morning.

HOUR CIRCLES, or HORARY CIRCLES, great circles of the sphere, passing through the poles, and consequently perpendicular to the equator. They are meridians at every $\frac{1}{24}$ part of the circumference, their planes thus making angles of 15° with each other.

HOURIS, the black-eyed damsels of the Mohammedan paradise, formed of pure musk, and made by a peculiar creation perpetual virgins. They dwell in green gardens and pearl pavilions, among lotus and acacia trees, with fruits in abundance, near flowing streams, reposing on lofty couches adorned with gold and precious stones. Some of the pavilions which they occupy are 60 miles square. The very meanest of the faithful will have 72 houris, beside the wives which he married when living. They join in concert with the angel Israfil, the most melodious of God's creatures, and the branches of the trees give an Æolian accompaniment. They may, if they desire, have children, which within an hour shall be conceived, born, and grow to maturity. Algazzali regards the descriptions of the houris in the Koran as allegorical, and designed to convey an impression of the spiritual beatitude of the saints; and the orientalist Hyde affirms that a more enlightened belief than the literal interpretation prevails among the wiser Mohammedans.

HOURS (Gr. ὥραι; Lat. *Horæ*), in classical mythology, the goddesses of the order of nature. In Homer they are the ministers of Zeus, guardians of the gates of Olympus, and rulers of the clouds and weather. In Hesiod they are the daughters of Zeus and Themis (Justice), who provide not only the fruits in their season, but give to a state good laws, justice, and peace. They are usually mentioned in connection with the graces and the nymphs as attendants on the Olympian divinities, adorned with wreaths of flowers, and bringing blessings to men. Their number was indefinite; in Athens two only were worshipped, Thallo and Carpo, the Hours of spring and of the harvest season. On works of art they appear as blooming maidens, carrying the products of the seasons. The Hour of spring, the Chloris of the Greeks and the Hora of the Romans, is especially celebrated in sculp-

tures as the attendant of Venus rising from the sea, and of Proserpine on her ascent from the lower world.

HOUSATONIC, a river of New England, which rises in Berkshire co., Mass., and, flowing S., enters the state of Connecticut. After winding through Litchfield co., and forming the boundary between New Haven co. and Fairfield co., it falls into Long Island sound below Milford. Its entire length is about 150 m. Its scenery in general is very picturesque, and on its banks are numerous large mills. The Housatonic railroad follows its course for nearly 40 m.

HOUSELEEK (*sempervivum*, Linn.), a genus of plants of the natural order *crassulaceæ*, having thick succulent stems and leaves, and ornamental flowers, either yellow or red. The houseleeks are to be found wild from Siberia to Italy and the Canary islands, and are to be met with in almost every garden. The most common is *S. tectorum* (Linn.), having very thick, succulent leaves, disposed about a short stem in a circular manner. It will grow in the most scanty soils and where it is exposed to drought, patches of it several feet in circumference thriving for years upon the exposed surfaces of rocks that are partially shaded. In Smaland, according to Linnæus, it is made a preservative to the covering of houses. The following are the most remarkable kinds. The hen and chicken houseleek (*S. soboliferum*, Linn.) is so called from the main plant being surrounded by small offsets, each resembling the parent, but younger. The tree houseleek (*S. arborescens*) assumes somewhat the form of a tree by the branching of its stem; its leaves grow upon the extremities; its flowers are in a spike, and are of a pleasing yellow. Some years ago it was a common parlor plant, but seems to have fallen into discredit. The globular houseleek (*S. globiferum*, Linn.) is a native of Germany, having large, showy, yellow flowers, and proves to be hardy under cultivation. The one-flowered houseleek (*S. monanthes*, Aiton) has very small, tufted stem leaves, from the centre of which rises a single reddish flower; it is a native of the Canaries. The cobweb sedum of the older gardeners (*S. arachnoideum*, Linn.) proves to be a houseleek with small, tufted stem leaves, the tips of which are woven over with filaments like spiders' threads. This species in cultivation does best when it is exposed to the sun, the flower stems and the blossoms assuming a beautiful roseate hue. It grows naturally upon the Italian Alps.—The houseleeks are not remarkable for any very extensively useful qualities. The fresh leaves of the *ensão* of Madeira (*S. glutinosum*, Aiton) are used by the fishermen to rub upon their nets, rendering them as durable as if tanned. Malic acid combined with lime exists in *S. tectorum*. Its juices are considered cooling, and its bruised leaves are used as applications to burns, ulcers, and inflammation, and from them also a simple and cooling salve is prepared.

HOUSSA, or HAUSA, a country of central Africa, bounded N. by the Sahara, E. by Bornoo, S. by Nufi or Tappa, and W. by the Joliba. It forms a part of the empire of Sackatoo. The people are negroes, and the Foolahs or Fellatahs are the ruling race. According to Dr. Barth, the country is divided into 10 provinces, viz.: Kano, Boshi, Zegzeg, Khadedsha, Katagum, Katsena, Daura, Zantara, Gober, and Kebbi. Kano, in the province of the same name, is the principal city in point of commerce, and has about 40,000 inhabitants; it is in lat. $12^{\circ} 0' 19''$ N. and long. $8^{\circ} 30' E.$ Katagum, E. of Kano, has from 7,000 to 8,000 inhabitants. Sackatoo, in the W. part of the country, has upward of 20,000 inhabitants, and has one of the best supplied markets in central Africa. Wurno, 15 m. N. E. of Sackatoo, on the river Rima, is a new town founded in 1831; its population is about 12,000. Zaria, the capital of the province of Zegzeg, is in lat. $10^{\circ} 59' N.$ and long. $8^{\circ} 0' E.$; it is surrounded by a beautiful and highly cultivated country, and its population is estimated at 50,000. Houssa is well watered, being traversed by the rivers Sackatoo, Mariadi, Zirmie, Bugga, Zoma, and other branches of the Niger. It is considerably elevated above the sea, and its climate is consequently cooler and more healthy than that of the other countries of central Africa. The land is well cultivated, the principal crop being Indian corn, of which two harvests are annually produced. Cotton is largely raised, and Kano is famous throughout central Africa for its dyed cloths. Tobacco, indigo, rice, and various kinds of grain and fruits, are diligently cultivated. At Sackatoo there are extensive manufactures of leather, iron, and cotton cloths; and an active commerce is carried on in all the cities by means of open markets, which are frequented by traders from the neighboring countries and from remote parts of the continent. The people of Houssa are mostly Mohammedans. They have attained to some degree of civilization, have a written language, and have historical records reaching back to the 13th century of our era. They were converted to Mohammedanism in the 16th century, and were conquered by the Foolahs in 1807, when Katsena, then their principal city, surrendered after a desperate defence of 7 years.

HOUSSAYE, ARSÈNE, a French miscellaneous writer, born in Bruyères, near Laon, in 1815. While a young man he went to Paris, where two light novels introduced him to the literary world in 1836, and he afterward published a number of humorous tales, as *Les aventures de Margot*, *Le serpent sous l'herbe*, *La vertu de Rosine*, and *Les trois sœurs*; biographical sketches, as *Galerie de portraits du 18^e siècle* and *Philosophes et comédiennes*; light poems, as *Les sentiers perdus* and *La poésie dans les bois*; and critical notices in various periodicals, all which gave him a standing among the literary fraternity. In 1846 his *Histoire de la peinture Hollandaise*, in 1 vol. fol., with 100

engravings, was aided by a subscription of 50,000 francs from the government. From 1844 to 1849 he was the proprietor and editor of *L'artiste*, a periodical especially devoted to the fine arts. He abandoned it to become manager of the *théâtre Français*, which post he still retains. Since 1856 he has been inspector-general of the provincial museums. His official functions have not interfered with his literary pursuits. His more recent works are: *Le voyage à ma fenêtre*, *Les filles d'Eve*, *Le violon de Franjolé*, and above all *L'histoire du 41^e fauteuil*, and *Le roi Voltaire*. The first number of a new edition of his works, to be published monthly, appeared in Dec. 1859, and his new works on Mlle. de la Vallière and Mme. de Montespan are announced for 1860.

HOUSTON, the name of 3 counties in the United States. I. A central co. of Georgia, bounded E. by the Ocmulgee river, which is navigable by steamboats; area, 875 sq. m.; pop. in 1852, 16,842, of whom 10,762 were slaves. The surface is undulating, and the soil, of limestone formation, is very fertile. The productions in 1850 were 662,600 bushels of Indian corn, 46,830 of oats, 188,224 of sweet potatoes, 19,362 bales of cotton, and 71,720 lbs. of rice. There were 6 grist mills, 10 saw mills, a cotton factory, a woollen factory, 24 churches, and 616 pupils attending public schools. The southwestern and Muscogee railroad passes through the county. Capital, Perry. II. An E. co. of Texas, bounded N. E. by Neches river, and W. by Trinity river; area, 1,090 sq. m.; pop. in 1857, 5,929, of whom 1,666 were slaves. It has a highly fertile soil, and a rolling surface diversified in some places with hills, and well timbered with oak, pine, ash, hickory, black walnut, &c. The productions in 1850 were 71,495 bushels of Indian corn, 21,707 of sweet potatoes, 750 bales of cotton, 82 hogsheads of sugar, and 44,476 lbs. of butter. Trinity river is navigable in this part of its course. Value of real estate in 1858, \$681,284. Capital, Crockett. III. A new co. in the S. E. extremity of Minnesota, bordering on Iowa and separated from Wisconsin by the Mississippi river; area, about 600 sq. m.; pop. in 1857, 5,264. It is drained by Ilokah or Root river and several small streams. Capital, Caledonia.

HOUSTON, a city and the capital of Harris co., Texas, situated at the head of steamboat navigation on Buffalo bayou, 45 m. above its mouth in Galveston bay, and 200 m. E. S. E. from Austin; pop. in 1850, 2,390; in 1858, 4,815. It is built on the left side of the bayou, surrounded by an excellent grazing country. Steamboats give it easy communication with Galveston, which is about 80 m. distant by water, and it is the principal shipping point for several of the neighboring counties. The Houston and Texas central railroad, now completed 35 m. N. W. from Houston, will open an intercourse with the northern parts of the state; the Buffalo bayou, Brazos, and Colorado is finished from Harrisburg, 5 m. below this city, to Rich-

mond on the Brazos, and is connected with Houston by a branch; and the Galveston, Houston, and Henderson is being rapidly constructed. Houston contains churches of 5 or 6 denominations, a number of schools, 4 or 5 newspaper offices, iron foundries, machine shops, cotton presses, and several manufactories. It was settled in 1836, and during the following year was temporarily the seat of government.

HOUSTON, GEORGE SMITH, an American statesman, born in Williamson co., Tenn., Jan. 17, 1811. In his youth his parents removed to Alabama, and settled in Lauderdale co. After completing his scholastic course, he studied law, was admitted to the bar in 1831, and practised his profession with great success at Florence. In 1832 he was elected to the lower house of the Alabama legislature. In 1838 he was elected by the legislature state's attorney for the Florence judicial district. In the spring of 1841 he was elected to congress, and by successive re-elections he has continued a member of congress up to the present time (1860), with the exception of a single term (1849-51), when he declined a nomination. In politics Mr. Houston is a conservative democrat. He was a decided opponent of the tariff of 1842, and was an early and active advocate of the annexation of Texas. He was a defender of the leading measures of Mr. Polk's administration; and as a member of the committee of ways and means in 1846, he had a large part in framing the tariff of that year. At the organization of the house in 1851, Mr. Houston was placed at the head of the committee of ways and means, and held this position for 4 years. As chairman of that committee in 1854 he reported a bill making the appropriation for carrying into effect the Gadsden treaty with Mexico. The bill gave rise to a protracted debate, the leading opponent of the measure being the late Thomas H. Benton. At the beginning of the 35th congress (1857) Mr. Houston became chairman of the judiciary committee.

HOUSTON, SAM, general, governor and ex-president of Texas, born near Lexington, Rockbridge co., Va., March 2, 1793. He is descended from Scottish Covenanters who took refuge from persecution in the north of Ireland, whence their descendants emigrated to Pennsylvania about the beginning of the 18th century. His father served in the revolutionary war, and held the post of inspector of brigade till his death in 1807. The mother of Sam Houston, a tall, strong, intelligent, and energetic woman, after her husband's death boldly plunged into the wilderness with her 6 sons and 3 daughters, and settled in Blount co., E. Tennessee, on the very edge of civilization, within 8 miles of the Cherokee country. Sam, who had learned to read and write in Virginia, was sent to an academy which had just been opened in the settlement. He had read a few books, among them Pope's translation of the *Iliad*, which he had studied so thoroughly that he could repeat nearly the whole poem from memory. He ar-

dently desired to learn Greek and Latin, but on asking permission from the master to add those languages to his list of studies, was refused, upon which he declared that he would never recite a lesson of any other kind while he lived. He left the school, and was compelled by his elder brothers to enter a store as a clerk. This occupation, however, he had no relish for; and speedily absconding, he crossed the Tennessee river and took up his abode with the Indians, by whom he was kindly received, and with whom he lived after their own fashion for about 3 years. Though under 18 years of age, he was 6 feet in height, and an expert and active hunter, and consequently stood high in the esteem of his savage associates. Oolooteka, one of their chiefs, adopted him as his son. In 1811 he abruptly returned to his family, and to maintain himself opened a school, which was soon thronged with pupils at what was then considered the exorbitant rate of \$8 a year, one third to be paid in corn, one third in cash, and one third in domestic cotton cloth. In 1813, during the war with Great Britain, he enlisted as a common soldier in the U. S. army, and after serving for some time on the southern frontier was promoted to be an ensign, and fought in that capacity under Gen. Jackson against the Indians at the battle of the great bend of the Tallapoosa, March 24, 1814. Here, while leading a forlorn hope in storming the Creek fortification, he received an arrow in his thigh and two rifle balls in his right shoulder. His intrepidity in this action attracted the notice and secured to him the lasting friendship of Gen. Jackson. But it was more than a year before he recovered from his wounds, which the surgeons had pronounced mortal, and which only an uncommonly vigorous constitution could have survived. After the ratification of peace in 1815 he was promoted to be a lieutenant, and was stationed with his regiment near Knoxville, Tenn., and afterward at New Orleans. At the latter place the wound in his shoulder broke out afresh, and he underwent a painful and dangerous operation which nearly cost him his life. After a winter of extreme suffering, he sailed for New York in April, 1816, where he remained several weeks, and with health somewhat improved returned to Tennessee by way of Washington. He was stationed at Nashville, Jan. 1, 1817, and in November of that year was appointed a subordinate Indian agent to carry out the treaty with the Cherokees which had just been ratified. In the following winter he conducted a delegation of Indians to Washington. On arriving at the capital he found that complaints had been made against him to the government on account of the zeal with which he had exerted himself to prevent the unlawful importation of African negroes through Florida, then a Spanish province, into the southern states. He was acquitted of all blame by the government; but conceiving himself to be ill treated he resigned his commission in the army, March 1, 1818, and returning to Tennessee settled in Nashville

and began to study law. He applied himself with such diligence to his studies that in six months he was able to pass a rigid examination, and was admitted to the bar. He purchased a small library on credit, and began practice in Lebanon, Wilson co., 30 miles east of Nashville. He was soon appointed adjutant-general of the state, with the rank of colonel, and in less than a year after he began to practise he was, in Oct. 1819, elected district attorney of the Davidson district, which made it necessary for him to take up his residence in Nashville. He was remarkably successful in prosecution, and notwithstanding his inexperience he was able to cope with the most formidable antagonists that were brought against him from a professional circle of unusual talent, such as then composed the bar of Nashville. In Dec. 1821, he was elected major-general of militia, and in 1823 he was elected a representative to congress without opposition. He was re-elected in 1825 by an almost unanimous vote, and in Aug. 1827, was chosen governor of Tennessee by a majority of 12,000. His personal popularity was very great, and it is said that on his accession to office he had not a single opponent in the state legislature. In Jan. 1829, Gov. Houston was married, and in April, for reasons unknown to the public, separated from his wife, resigned his office, and abandoning civilization went to the west of Arkansas, to which his former friends the Cherokees had removed, and presented himself before Oolooteka, by whom when a boy he had been adopted, and who had become the principal chief of the tribe. He was kindly received, and by an official act of the ruling chiefs, Oct. 21, 1829, was formally admitted to all the rights and privileges of the Cherokee nation. For years he remained among the Indians, until, his indignation being powerfully aroused by the frauds and outrages practised upon them by the whites, he proceeded to Washington in 1832, and made such a representation in their behalf that the president ordered an investigation, which resulted in the removal of 5 government agents from office. A great clamor, however, was raised by the removed parties and their friends, and Gen. Houston became involved in a series of personal and legal contests of a disagreeable and harassing nature. He was openly accused in the house of representatives of having attempted to obtain from government a fraudulent contract for Indian rations. This charge led to a personal rencontre on Pennsylvania avenue between Gen. Houston and W. R. Stansbury of Ohio, the member by whom it was made, who was severely beaten in the affair. For this he was arrested, brought before the house, and publicly censured by the speaker. He was also indicted and tried for assault, and fined \$500 and costs. The sentence of the court, however, was not enforced, and the fine was afterward remitted by President Jackson. A committee was appointed by the house to investigate the charge of fraud in procuring a con-

tract for furnishing Indian rations. Mr. Stansbury, his recent antagonist, was appointed chairman, but after a thorough investigation the committee reported that not the slightest evidence appeared to sustain the charge. Wearied and disgusted with these broils, Houston quitted Washington and returned to his wigwam near the Arkansas river. He did not, however, long remain there, but in Dec. 1832, he set out for Texas, with a few companions, avowedly for the purpose of becoming a herdsman on the prairies, but, as was commonly reported, with the intention of taking part in the revolutionary movement then organizing there against the Mexican government. Soon after his arrival in Texas the town of Nacogdoches, where he had settled, elected him delegate to the convention called to frame a constitution for the new state. It met April 1, 1833, and Houston exercised over its deliberations a controlling influence. When the war with Mexico began he was chosen general of the military district east of the Trinity, and in Oct. 1835, mustered his forces and led them to the camp of Gen. Austin, who was besieging Bexar. On his arrival, Austin, who had been chosen commander-in-chief, offered to resign the command to him, but Houston declined to accept it. A council of the officers held soon afterward, however, elected him commander-in-chief of the Texan army, with only one dissenting vote among 50 members. He accepted the post, and promptly proceeded to organize the forces of the state. He was much impeded in this by jealousies and dissensions among the leaders of the civil government, by some of whom he was accused of seeking to establish a military despotism. Consequently, after the declaration of independence, which took place on his birthday, March 2, 1836, and by which the state of Texas finally severed her connection with the Mexican confederation, of which to that time she had been at least nominally a member, Houston resigned his command, as the provisional government by which he had been appointed had ceased to exist. The convention which declared the state independent immediately reelected him commander-in-chief of the army of the new republic. Again there was but one dissenting vote. On March 10 he went to the camp at Gonzalez and took command of the army. It consisted of 374 men, ill organized, poorly armed, and without supplies for a campaign. The fort of the Alamo, which against Houston's orders had been held by Col. Travis, had just been taken by the Mexicans, and the whole of its garrison of 185 men put to death. On March 12 information reached the camp of this massacre, accompanied by the statement that the president of Mexico, Santa Anna, was close at hand with an army of 5,000 men. The wildest panic seized the Texan camp. Some of the officers set fire to the tents, and many of the men mounted their horses and fled. Houston was a few hundred yards from the camp when the news

arrived. Returning, he promptly restored order, sent in pursuit of the fugitives, who were mostly overtaken and brought back, directed the fires to be extinguished, and fell back 10 miles to Peach creek. There he received a reinforcement of about 100 men. He continued his retreat until he reached the Colorado, receiving from time to time small reinforcements, till at length the entire number of his force was 650 men. But he had no artillery, and was unwilling to give battle to the enemy till he had received supplies of ammunition and cannon. Col. Fannin, who was stationed at Goliad with 500 men well armed and supplied with artillery, had been ordered by Houston to abandon the place and join him. But Fannin had neglected to obey until too late. He was intercepted on the march by the Mexicans under Gen. Urrea with a vastly superior force, and, after a desperate defence of two days behind an intrenchment of wagons, baggage, and earth, he capitulated, March 20, Gen. Urrea agreeing that the Texans should be humanely treated and sent to the United States. On March 27, however, they were shot in cold blood to the number of 337. This dreadful massacre spread consternation over Texas. Santa Anna, flushed with his success, continued to advance till he reached Harrisburg, the capital, which he laid in ashes, and marched upon the town called New Washington. Here upon the San Jacinto he was encountered by Houston, who had at length received, on April 10, two 6-pounders sent to him from Cincinnati. His force had been increased till it numbered 783 men, all volunteers, most of whom had never seen a battle, while that of the Mexicans was about 1,600, and consisted of veteran troops trained in the long civil wars of their country. The battle took place on the afternoon of April 21. It began with a fire of grape and canister from the Texan 6-pounders, which was followed by a general charge led by Houston in person, amid shouts of "Remember the Alamo!" "Remember Goliad!" The Mexicans, sheltered by breastworks, received them with a heavy fire of musketry and artillery. A bullet shattered Houston's ankle, and his horse was wounded by several shots in the breast, but he spurred the dying animal to within a few yards of the enemy's intrenchment, over which the Texans, having first poured in a terribly destructive fire from their rifles, forced their way in spite of a stout resistance. Having no bayonets, and not stopping to reload their rifles, the Texans used them as clubs, and with their pistols and bowie knives attacked the Mexicans with such fury that in a few minutes after their camp was entered they gave way in all directions, and fled totally routed to the swamps and woods in their rear. Very few escaped; 630 were killed, 208 wounded, and 730 taken prisoners. The Texan loss was 8 killed and 25 wounded. Houston rode about the field exerting himself to stop the carnage, regardless of his own wound, until exhausted by loss of blood he fell from his

horse, and was carried by his aids and laid at the foot of an oak which had served as his headquarters before the battle. The next day President Santa Anna, disguised as a common soldier, was captured on the prairie, and brought before Houston, who rebuked him for the cruel and perfidious massacres of Goliad and the Alamo, but treated him with the consideration due to his rank, and protected him from the wrath of the Texans, some of whom were disposed to put him to death in retaliation for the slaughter of their friends and relatives. At Houston's recommendation the Texan government made a treaty with the captive president, by which the independence of Texas was admitted, and orders given to the Mexican forces immediately to evacuate her territory. As his wound rendered him nearly helpless, he requested to be relieved from the command of the army, and to have Gen. Rusk appointed in his stead. His request was complied with, and, to obtain proper medical attendance, he sailed for New Orleans, where he arrived May 28, almost in a dying condition, his wound having begun to show symptoms of mortification. In July, his wound having greatly improved, he returned to his home in Nacogdoches. On July 23 a general election for president, vice-president, and members of congress of the republic of Texas was ordered to take place on the first Monday of the following September. Gen. Houston was solicited to be a candidate, but positively declined. There were two candidates, both men of distinction in Texas, Stephen F. Austin, the leader of the first colonists, and Henry Smith, who had been governor during the late revolution. Houston did not wish to stand in the way of either of these candidates; but as the day of election approached the popular feeling in his favor became so manifest that he had no alternative but to accept. In a letter dated Nov. 15, 1832, he thus gives his reasons for accepting: "It was not a desire to obtain the office of president which ultimately caused me to let my name be used; but there were two parties in Texas, which were known as the Austin and Wharton parties. Gov. Smith was the ostensible head of the Wharton party. So far as I could judge, the parties were pretty equally balanced. In this posture of affairs, I was firmly impressed with a belief that, if either of the gentlemen should be elected, it would be next to impossible to organize and sustain a government; as, whoever he might be, he would be compelled to fill all the offices with his own friends, and those of opposite feelings would of course oppose the administration, which, in the then condition of the country, could only be sustained by the united efforts of the community. Not being identified with either of the parties, I believed I would be enabled so to consolidate the influence of both, as to form an administration which would triumph over all the difficulties attendant upon the outset of the constitutional government of Texas." He was elected by a large majority, and was

inaugurated Oct. 22, 1836. In forming his cabinet, he gave the two most important offices to his rivals for the presidency. Gen. Austin was made secretary of state, and Gov. Smith secretary of the treasury. This magnanimous act put an end for the time to party strife, and gave the new administration the universal support of the country. One of his first acts was to liberate Santa Anna, who had been kept in captivity in constant peril of his life, and to send him to Washington to confer with the president of the United States, Gen. Jackson. He next opened negotiations with the U. S. government for the annexation of Texas to the Union, but the measure encountered such strong opposition in the United States that it did not succeed till several years later. President Houston's term expired Dec. 12, 1838; and as the constitution made him ineligible for the next term, he was succeeded by Mirabeau B. Lamar. He went out of office leaving the republic with a government perfectly organized, with her finances in a good condition, at peace with the Indians, with commercial intercourse restored with Mexico by the wise moderation of his views and actions, and with agriculture, commerce, and population rapidly increasing. During the 3 years of the next presidential term Texas became involved in desolating wars with the powerful Indian tribes on her borders, in rash, costly, and disastrous expeditions against the Mexican territories, and in debt to an enormous amount. The expenditures for the year 1841 amounted to \$1,176,288, while the receipts were only \$442,604. The result was a general demand that Sam Houston, who had meanwhile been twice elected to congress, should return to office and restore order and economy to the finances, peace with the Indians and with Mexico. He became a candidate, and was elected in Sept. 1841, by more than three quarters of the votes. In his inaugural address, sketching the state of the finances, he said: "There is not a dollar in the treasury. The nation is involved in debt from 10 to 15 millions. The precise amount of its liabilities has not been ascertained. We are not only without money, but without credit, and, for want of punctuality, without character." After a stormy administration, beset at the outset with difficulties of the gravest character, which were met with firmness and overcome with great judgment and ability, Houston retired from his second presidential term in Dec. 1844. He had paid off a large amount of the national debt, had kept the expenditures far within the revenues, restored peace and trade with Mexico, made treaties with all the hostile Indian tribes, and lastly had negotiated successfully the great measure of annexation to the United States, though its final consummation did not take place till after the expiration of his constitutional term of office, when he became again ineligible by the clause which limited the president to one term. Texas became one of the United States in 1845, and Sam Houston and Thomas J. Rusk were the first senators

she sent to Washington. Houston was reelected at the end of his term in 1853, and remained in the senate till March 4, 1859. As a senator, he was, as he ever had been, the zealous advocate of justice and humanity to the Indians. He opposed the Kansas and Nebraska bill, against which he made one of his most elaborate speeches, March 3, 1854, in which he declared that the repeal of the Missouri compromise was a flagrant breach of faith, which would involve the country in interminable agitation and difficulty. In the same debate he defended the 3,000 New England clergymen who had sent to congress a memorial remonstrating against the passage of the bill, for which they had been assailed. In his speech of March 3 he gave in his adhesion to the "Know-Nothing" or American party. By many of the newspapers of that party his nomination for the presidency was at this time warmly advocated, and in Oct. 1854, the general committee of the democrats of New Hampshire issued an address, recommending him as a candidate in the election of 1856. In the Lecompton controversy of 1855 he voted with those who upheld the legality of the Lecompton constitution. In 1858, the democrats opposed to Houston having a majority in the Texas legislature, J. W. Hemphill was elected senator in his place. But on returning to Texas in 1859, Houston became a candidate for governor of the state, and was elected to that office by the people on Aug. 1.

HOVEDEN, ROGER DE, an old English chronicler, born in Yorkshire about the middle of the 12th century. The dates of his birth and death are uncertain, but it is known that he was attached to the court of Henry II., and that he was employed in visiting monasteries, and in watching over the revenues that accrued to the king on the death of the superiors. His history, *Annales Rerum Anglicarum*, is a continuation of the ecclesiastical history of Bede, beginning where he left off (731), and extending to 1202, the 3d year of the reign of King John. The history is written with great care and detail, and its accuracy is attested by the best antiquaries, Sir Henry Savile, Selden, Leland, and Nicolson. It was published in Savile's *Scriptores post Bedam* (London, 1595), and has been translated by H. F. Riley, for Bohn's "Antiquarian Library."

HOVEY, ALVAH, D.D., an American clergyman, born in Greene, Chenango co., N. Y., in 1820. He was graduated at Dartmouth college in 1843. Having taught in the academy at New London one year, he studied theology at Newton, completing the regular course in 1848; spent a year as minister of the Baptist church in New Gloucester, Me., and in 1850 returned to Newton theological institution, and taught in the department of biblical literature till 1853. He became professor of ecclesiastical history in 1853 and of Christian theology in 1855, and received the degree of D.D. from Brown university in 1856. He has published a translation from the German of Perthes' "Life of Chrysos-

tom," in conjunction with the Rev. D. B. Ford (Boston, 1854); "The Christian Pastor," a sermon (1857); "Life and Times of Backus" (1858); "The State of the Impenitent Dead" (1859); beside various contributions to reviews.

HOWARD, the name of 4 counties in the United States. I. A central co. of Md., bounded N. E. by the Patapsco river, and S. W. by the Patuxent; area, 225 sq. m. It has an uneven surface, rising in some places into hills. The valleys are generally fertile, and the productions are Indian corn, wheat, oats, and tobacco. The county was formed from the N. W. part of Anne Arundel co. in 1851. The Baltimore and Ohio railroad passes through Ellicott's Mills, the capital. II. A central co. of Ind., traversed by Wildcat creek, an affluent of the Wabash; area, 279 sq. m.; pop. in 1850, 6,657. It has a level surface and an excellent soil. The productions in 1850 were 238,853 bushels of Indian corn, 27,930 of wheat, 6,063 of oats, 569 tons of hay, and 60,896 lbs. of wool. There were 16 saw mills, 10 churches, and 1 newspaper office. The county originally formed part of the Miami Indian reservation. It was organized in 1844, and was at first called Richardville co. The Peru and Indianapolis and the Cincinnati and Chicago railroads intersect at Kokomo, the capital. III. A central co. of Mo., bounded S. and W. by the Missouri river, and drained by some of its small tributaries; area, 430 sq. m.; pop. in 1856, 15,085, of whom 5,684 were slaves. It abounds in anthracite coal, and has quarries of limestone and sandstone. The surface is rolling, and the soil very fertile. The productions in 1850 were 939,048 bushels of Indian corn, 114,196 of wheat, 97,534 of oats, 5,401 tons of hay, 3,188,122 lbs. of tobacco, and 48,590 of wool. There were 9 saw mills, 19 churches, 4 newspaper offices, and 2,053 pupils attending public schools. Capital, Fayette. IV. A N. E. co. of Iowa, bordering on Minnesota, and intersected by Upper Iowa river; area, about 430 sq. m.; pop. in 1859, 3,017. It is well timbered, and has tracts of prairie. Little more than $\frac{1}{4}$ of the land is improved. The productions in 1859 were 19,983 bushels of wheat, 58,892 of Indian corn, 21,778 of oats, 17,382 of potatoes, 2,377 tons of hay, and 69,975 lbs. of butter. Capital, New Oregon.

HOWARD, CHARLES, Lord Howard of Effingham, lord high admiral of England, born in 1536, died Dec. 14, 1624. His father, William Howard, a son of the 2d duke of Norfolk, and the first English ambassador to the court of Russia, was in 1554 created Baron Howard of Effingham and lord high admiral of England, and died in 1573. Charles Howard entered the public service in 1559, being sent to France to congratulate Francis II. on his accession to the throne. Adopting the profession of arms, he served with credit on land and sea for many years, and in 1585 was appointed lord high admiral, in which capacity he succeeded by his prudence and bravery in averting from the English coasts the attack of the Spanish armada,

and in defeating and dispersing the fleet. (See ARMADA.) In 1596 he participated with the earl of Essex in the capture of Cadiz and the destruction of the Spanish shipping there, for which service he was created in October of the same year earl of Nottingham. The appointment of Essex in the succeeding year to be hereditary earl marshal, with precedence over the lord high admiral, induced Lord Howard to resign the latter office; but he subsequently resumed it, and in 1599, during the alarm at the prospect of another Spanish invasion, and of an insurrection under Essex in Ireland, was appointed by the queen lieutenant-general of England, with the command of all forces on land and at sea, an office which he held during 6 weeks. He commanded the party which captured Essex in London, whom he treated with great courtesy, notwithstanding the relations between them were far from friendly. He retained his office under James I. until a few years before his death, when he resigned it in favor of Buckingham, receiving in compensation a pension of £1,000, and the acquittal of a debt due the crown. He was held in great estimation by Elizabeth and James for upward of 50 years, and, according to Fuller, though "no deep seaman," was "an hearty gentleman, cordial to his sovereign, and of most proper person."

HOWARD, HENRY, earl of Surrey, an English poet, born about 1517, beheaded on Tower hill, London, Jan. 21, 1547. He was the eldest son of Thomas Howard, 3d duke of Norfolk, and passed his youth at the court of Henry VIII., where, in intimacy with the young duke of Richmond, the king's natural son, whom he accompanied to the university of Oxford, he was educated as one of the royal pages. In his 19th year he was knighted by the king. In consequence of irregularities of conduct he was on two occasions imprisoned for a short time in the Fleet. In 1542 he first saw active military service on a marauding expedition into Scotland, headed by his father, the duke of Norfolk. He also participated in the wars with France between 1544 and 1546. An attempt to intercept a convoy of provisions near St. Etienne, which failed through a panic among his troops, afforded an opportunity to his rival, the earl of Hertford, afterward the protector Somerset, to induce the king to recall him to England. His imprudent comments upon what he considered an unmerited disgrace having excited the jealousy of Henry, he was sent to the tower, from which however he was released after a short imprisonment. But the Hertford faction evidently lost no opportunity to excite the fears of the king, then sinking into the grave, and on Dec. 12, 1546, Surrey with his father was again arrested on a charge of treason, for having quartered the royal arms with his own. The depositions of Elizabeth Holland, the duke of Norfolk's mistress, and of his own sister, were procured to substantiate this charge. It was in vain that Surrey in an eloquent defence

proved conclusively his right to assume the royal arms. His death had been decided upon, and he was found guilty and executed about a week before the death of the king. His works, consisting of sonnets, amatory verses, elegies, paraphrases from the Scriptures, and translations of the 2d and 4th books of the *Æneid*, form an era in the literature of the language, from which the Elizabethan period properly dates, and afford the first instance of the use of the sonnet and of blank verse in English poetry. They circulated in great numbers in printed copies and in manuscript for many years after his death, and recently excellent editions have been published by Dr. Nott (2 vols. 4to., 1815-16), with a memoir, &c., by Sir Harris Nicolas, forming part of Pickering's Aldine edition of the British poets; and by Prof. Child (12mo., Boston, 1854).

HOWARD, JONN, an English philanthropist, born in Enfield, Sept. 2, 1726, died in Kherson, Russia, Jan. 20, 1790. He was naturally of a delicate constitution, and passed his childhood and youth in the country, receiving a tolerable education, but evincing little intellectual brilliancy or ambition. At 16 years of age he was apprenticed to a grocer in London; but upon the death of his father soon after, he purchased his indentures and departed on a tour of the continent. Returning to England, he fixed his residence at Stoke Newington, and occupied himself with medical and scientific studies. At about the age of 25 he experienced a severe attack of illness, and upon his recovery testified his gratitude to the woman who had nursed him, and who was nearly 30 years his senior, by marrying her. She died at the end of 3 years, and Howard, moved by the accounts of the horrors of the earthquake at Lisbon, embarked for that place with a view of doing something to alleviate the calamity. On the voyage he was taken prisoner by a French privateer and carried into Brest, where he became a witness of the inhuman treatment to which prisoners of war were subjected. Having by his personal exertions procured the exchange of himself and his fellow captives, he returned to England, married a second time in 1758, and settled upon an estate at Cardington, Bedfordshire, which he had inherited from his father. His career of active philanthropy may be said to date from this time. Observing the low moral condition of the neighboring peasantry, he built schools and model cottages, the latter the first erected in England, for their benefit; and being after a while aided by the neighboring gentry, among whom was his friend Samuel Whitbread, the well known brewer, he succeeded in effecting such changes in the habits of the people and in the appearance of their residences, that Cardington, formerly a wretched and filthy village, attracted the attention of strangers by its neatness, the healthful appearance of its inhabitants, and the general aspect of thrift which it presented. In 1767 his second wife died, and for several years he was employed in

his studies and reformatory plans, and in travelling on the continent. Returning to England in 1773, he accepted the office of sheriff of Bedfordshire, for which he had been named in his absence, and upon the opening of the assizes in Bedford visited in his official capacity the town gaol, the same in which John Bunyan was confined for 12 years, and where he wrote his "Pilgrim's Progress." The filthy state of this building, and the wretched condition of the prisoners, made a deep impression upon him. But the fact that many innocent persons were detained there for months and sometimes for years, from inability to pay their fees of gaol delivery, so shocked his notions of justice that he instantly proposed to the magistrates to release such persons, and to provide against their future detention by paying regular salaries to the gaolers, in place of the fees they were accustomed to collect from the prisoners. The magistrates, unprepared for such an innovation in gaol economy, asked for a precedent, and Howard spent many months in fruitless exertions to find one, in the course of which he visited every town in England containing a prison. He nevertheless collected a mass of information respecting the abuses in the management of prisons, which he communicated in a report to the house of commons, who thanked him for his zeal and humanity, and in June, 1774, passed bills "for the relief of acquitted prisoners in the matter of fees" and "for preserving the health of prisoners." Subsequently at his own expense he caused copies of the new laws to be sent to every gaoler in the kingdom. The prominence thus given to his name suggested him as a candidate for the representation of Bedford in the house of commons, and at the solicitation of his friends he offered himself, with his friend Whitbread, to the electors of that borough. His sympathy with the American cause in the controversy between the colonies and the mother country, which he was not backward in expressing, aroused the ministry to oppose him; and although he was elected, a parliamentary scrutiny subsequently unseated him. He never afterward participated in political life, but, fortunately for the interests of humanity, was enabled to give his whole time to the philanthropic plans in which he had embarked. Following up the subject of prison abuse, he re-examined the principal penal establishments of England, and then visited those of France, Germany, Holland, and Belgium. Not satisfied with the information thus acquired, he made a new tour through England, examining the operation of the new gaol act and relieving much distress among poor debtors, and revisited a large portion of the continent. The result of these laborious researches subsequently appeared in his "State of the Prisons in England and Wales, with Preliminary Observations and an Account of some Foreign Prisons" (4to., 1777), a work of profound interest, and which caused him, says his biographer Aikin, "to be regarded as one of the extraordinary characters

of the age, and the leader in all plans of meliorating the condition of that wretched part of the community for whom he interested himself." One of the first fruits of this publication was the determination of the ministry to make a trial of the discipline of hard labor in one of the large prisons. But as no building was adapted to the purpose, Howard undertook in 1778 another tour over the continent to collect plans and such information as should be necessary, in the course of which he visited Holland, Belgium, Germany, Italy, and France, and travelled upward of 4,600 miles. In the succeeding year he made another survey of English prisons, and in 1780 published an appendix to his work. It was in this year that Edmund Burke in a speech to the electors of Bristol thus eloquently summed up the public services of Howard: "He has visited all Europe, not to survey the sumptuousness of palaces, or the stateliness of temples; not to make accurate measurements of the remains of ancient grandeur, nor to form a scale of the curiosity of modern art; not to collate medals or collect manuscripts;—but to dive into the depths of dungeons; to plunge into the infections of hospitals; to survey the mansions of sorrow and pain; to take the gauge and dimensions of misery, depression, and contempt; to remember the forgotten, to attend to the neglected, to visit the forsaken, and to compare and collate the distresses of all men in all countries." The information contained in his appendix having been laid before the house of commons, a bill, drafted by Sir William Blackstone and Mr. Eden, was passed for building two penitentiaries on the hard labor system, of which Howard was appointed the first supervisor. Finding that his time was in danger of being uselessly consumed in discussions with one of his colleagues as to the site of the proposed buildings, he resigned his office, and between 1781 and 1784 travelled through Denmark, Sweden, Russia, Poland, Spain, and Portugal on his errand of inquiry and reform, publishing the results of his investigations in 1784 in a second appendix, together with a new edition of his work, containing much additional matter. The first great series of his labors, which had extended over a period of more than 10 years, terminates here; and in consideration of his impaired pecuniary resources and shattered health, he might have been considered entitled to repose during the remainder of his life. His sense of duty, however, allowed him no rest, and he embarked upon his second series of philanthropic researches with a zeal far surpassing his physical powers. The subject of hospitals and lazarettos had to some extent occupied his attention during his researches among European prisons, and in 1778 he had witnessed the terror with which the approach of contagious diseases was regarded in Mediterranean ports. He therefore readily volunteered to procure for the British government whatever information relating to quarantine establishments was available. Designing first to visit the

new lazaretto of Marseilles, he endeavored in vain to procure a passport from the French government, which was incensed against him for having published in 1780 a translation of a suppressed French account of the interior of the Bastille. He therefore travelled through the country in various disguises, and, after a series of romantic adventures and several narrow escapes from the police, who were constantly on his track, succeeded in his purpose. He proceeded thence to Malta, Zante, Smyrna, and Constantinople, visiting prisons, pest houses, and hospitals, and in the two latter cities gratuitously dispensing his medical services, and often with great benefit, to the poor. The freedom with which he exposed his person in infected places, whither his attendants refused to follow him, was characteristic of his fearless and self-sacrificing character; but as if by a miracle he escaped all contagion. His most daring act, however, has yet to be recorded. Feeling that he could not speak with authority on the subject of pest houses until he had experienced the discipline of one, he went to Smyrna, sought out a foul ship, and sailed in her for Venice. After a voyage of 60 days, during which by his energy and bravery he assisted the crew in beating off an attack of pirates, he arrived at his destination and was subjected to a rigorous confinement in the Venetian lazaretto, under which his health suffered severely. After recovering his strength he departed for England, where he arrived in Feb. 1787, after an absence of 16 months. In 1789 was published his second great work, "An Account of the Principal Lazarettos of Europe, with various Papers relating to the Plague, together with further Observations on some Foreign Prisons and Hospitals, and additional Remarks on the Present State of those in Great Britain and Ireland" (4to.), in the preface to which he announced his intention to pursue his inquiries in the same direction, observing: "Should it please God to cut off my life in the prosecution of this design, let not my conduct be imputed to rashness or enthusiasm, but to a serious conviction that I am pursuing the path of duty." In the summer of 1789 he started on his last continental tour, meaning to pass through Russia to the East, but was cut off by camp fever which he contracted from a patient at Kherson, on the Black sea. He expended nearly the whole of his large fortune in various benefactions. In his private relations he was pure-minded, pious, and upright; and the intimation that he treated his only son with harshness (who survived him 9 years in a lunatic asylum), has been effectually disproved by the researches of Mr. Hepworth Dixon, whose "Howard and the Prison World of Europe" (2d ed., 8vo., London, 1850) affords an able view of his character and services to humanity. See also the memoirs by Dr. Aikin, J. B. Brown, the Rev. J. A. Field, and T. Taylor. A marble statue of him was erected in St. Paul's cathedral, London.

HOWARD, JOHN EAGER, an American revolutionary soldier and statesman, born in Baltimore co., Md., June 4, 1752, died Oct. 12, 1827. His father, Cornelius Howard, acquired a handsome fortune by his marriage with the granddaughter of George Eager, whose estate now forms part of the city of Baltimore. Upon the breaking out of the revolutionary war he took up arms on the patriotic side, and in 1776 commanded a company in the flying camp, under Gen. Mercer, in which capacity he took part in the battle of White Plains. Upon the disbanding of his corps in 1776, he accepted the commission of major in one of the Maryland regiments of the line, joined the army under Washington at Middlebrook, N. J., in the spring of 1777, and subsequently fought at Germantown and Monmouth. In 1780, as lieutenant-colonel of the 5th Maryland regiment, he followed De Kalb to the South, fought in the disastrous battle of Camden under Gates (Aug. 16), and in the latter part of the year joined the army under Greene. In the battle of Cowpens, fought Jan. 17, 1781, he displayed great gallantry, and the bayonet charge of the Maryland troops under his command, whereby the enemy were thrown into confusion, turned the fortune of the day and secured victory to the Americans. At one period of the day he held in his hands the swords of 7 British officers who had surrendered to him, one of whom clung to his stirrups, asking for quarter. This was said to have been the first occasion in the war on which the bayonet was effectively used by the American troops, and the Maryland line, under Howard's command, subsequently became famous in the practice of it. For his services in this battle Col. Howard received from congress a silver medal. He fought with great valor at Guilford Court House (March 15), materially aiding Greene in effecting his retreat in an orderly manner, and again at Hobkirk's hill (April 25). After the latter battle he succeeded Lieut. Col. Ford in the command of the 2d Maryland regiment. At Eutaw Springs (Sept. 8) his troops performed prodigies of valor, and in their attempts to dislodge the enemy were so cut up that the command was reduced to Col. Howard, a single commissioned officer, and 30 men. With this small force he was returning to the charge when he was disabled by a severe wound, from the effects of which he never entirely recovered. At the close of the war he retired to his estate near Baltimore, and in 1788 was elected governor of Maryland, a position which he filled for 3 years. From 1796 to 1803 he represented his native state in the U. S. senate, and in 1798 was selected by Washington, then recently appointed commander-in-chief of the American forces in anticipation of a rupture with France, for one of his brigadier-generals. During the panic in Baltimore subsequent to the capture of Washington by the British troops in 1814, he was one of the most earnest opponents of the capitulation of the city, declaring that he would rather see his property

in ashes, and his sons, who had taken the field to oppose the enemy, in their graves, than consent to listen to such a proposal. He was esteemed for his amenity of manners and numerous social accomplishments, and died universally lamented. He was one of the most valiant soldiers of the revolution, and in the opinion of Gen. Greene deserved "a statue of gold no less than Roman and Grecian heroes."

HOWARD, THOMAS, duke of Norfolk, an English statesman and soldier, born in 1473, died in Aug. 1554. He was grandson of the duke of Norfolk who was killed at Bosworth, fighting for Richard III. In 1513 he became high admiral of England, and in the same year aided his father in gaining the battle of Flodden field, for which he was created earl of Surrey. He was afterward instrumental in quelling an insurrection in Ireland under O'Neal, and one incited by the Catholics in the north of England. Though a staunch Catholic, he succeeded by his prudent conduct in disarming for a long time the suspicion and jealousy of his capricious master, Henry VIII. He was finally accused of treason and condemned to be beheaded; but the monarch's death intervening before his execution, a respite was granted him, and he was kept a prisoner in the tower during the reign of Edward VI. On the accession of Mary he was restored to his rank and property.

HOWARD, THOMAS, earl of Arundel, an English diplomatist and antiquary, born in 1586, died at Padua in 1646. He was frequently employed by Charles I. on foreign missions, but is chiefly known by his celebrated collection of antiquities, which was procured for him at great expense by agents who travelled over Greece and Italy. It was dispersed at his death, but the larger portion came into the possession of Henry, 10th duke of Norfolk, who in 1667 presented it to the university of Oxford, where it is now known by the name of the Arundelian marbles.

HOWE, ELIAS, JR., an American inventor, born in Spencer, Mass., in 1819. He lived with his father, who was both farmer and miller, till 1836, working upon the farm and in the mill and attending the district school during the winters. He then learned the trade of a machinist, and experimented in inventing a sewing machine. The model was completed and the patent issued Sept. 10, 1846. A patent was also taken out in England, but from this the inventor has realized nothing. After constructing 4 machines in the United States, he visited England in 1847, remaining two years. He returned to Boston entirely destitute, and resumed his trade for the support of his family. From this period until 1854 he was involved in expensive lawsuits, when the principal infringers of his patents acknowledged his rights, and arranged to manufacture sewing machines under licenses from him. Up to 1854 less than 8,000 good sewing machines had been made; the number now manufactured is nearly 100,000. Of these 47,360 were sold during 1859. (See SEWING MACHINE.)

HOWE, JOHN, an English nonconformist di-

vine, born in Loughborough, Leicestershire, May 17, 1630, died in London, April 2, 1705. His father, being ejected from his living for non-conformity, retired to Ireland. Returning in 1641, he took up his residence in Lancaster, where he directed the studies of his son, who in his 18th year was graduated at Christ's college, Cambridge. While pastor of a nonconformist church in Great Torrington, he was selected by Cromwell in 1657 for his domestic chaplain, which office he retained till the death of Cromwell. After the restoration he returned to Great Torrington, and after the passage of the act of uniformity he led a wandering life, and continued to preach in private houses. He passed 5 years in Ireland, enjoyed great distinction as pastor of a congregation in London from 1676 to 1684, travelled on the continent with Lord Wharton in 1685, became pastor of the English church at Utrecht, returned to England in 1687, and in the following year headed the procession of nonconformist divines who congratulated William on his accession to the throne. He has been called the most profound and philosophical thinker of all the Puritans. A complete edition of his works, with a life by the Rev. John Hunt, appeared in London in 8 vols. (1810-'22), and with a life by Edmund Calamy in 1 vol. (1838). A biography, with an analysis of his writings, by Henry Rogers, was published in 1836.

HOWE, JOSEPH, a British colonial statesman, born in Halifax in 1804. He served an apprenticeship as a printer, assisting occasionally his eldest brother John, who had succeeded his father as postmaster-general. In 1827 he purchased conjointly with Mr. Spike the "Weekly Chronicle" newspaper, which was continued under the title of the "Acadian," and in Jan. 1828, he became sole editor and proprietor of the "Nova Scotian." In 1829 he published Haliburton's "History of Nova Scotia." In 1835 he was tried for libel on account of statements in his paper against the local government of Halifax, but acquitted, immediately after which all the magistrates of that town resigned. This became the signal of an increased agitation for the reforms which had long been advocated by Mr. Howe, who insisted upon incorporation acts for the cities of the British provinces, which up to that time were all governed by magistrates who held their commission from the crown, and were entirely independent of popular control. In 1839 he was challenged by John C. Haliburton, son of the chief justice, for words spoken in debate. The duel was fought at Point Pleasant, Mr. Howe receiving his adversary's fire and discharging his pistol in the air. In 1840 he became a member of the provincial cabinet, and soon afterward the old system which he had attacked and exposed was abolished, and Halifax received a municipal charter. Mr. Howe has been a member of the provincial parliament for over 20 years. He has officiated on several occasions as colonial agent in Great Britain, and was a member of the colonial gov-

ernment for many years until 1854, when he relinquished his office of provincial secretary to superintend the construction of the first railroad in Nova Scotia. He may be regarded as the father of the idea of responsible government in the British colonies, and his most important political letters, addressed to Lord John Russell, relate to that subject. See his "Speeches and Public Letters" (2 vols., Boston, Halifax, and London, 1858).

HOWE, SAMUEL GRIDLEY, an American physician, born in Boston, Nov. 10, 1801. From the Boston Latin school he was sent to Brown university, where he was graduated in 1821. He commenced the study of medicine in Boston, and when the Greek war of independence broke out, he desired to join the insurgents, but was unable to obtain his father's consent. He was an admirer of Byron, and when the latter devoted himself to the cause of Greek independence, Howe embarked in 1824, and landed at Monembasia, in Peloponnesus. He accompanied in the capacity of surgeon the army sent to oppose Ibrahim Pasha, and attempted to organize hospitals and ambulances; but the capture of Navarino threw every thing into confusion. Dr. Howe then joined one of the guerilla bands that hovered about the enemy, and was in active service about two years, taking his full share of all its hardships and sufferings. In 1826 he accompanied an expedition to Crete, and was some time shut up in the fortress of Grabusa, from which he escaped with difficulty. In 1827 he embarked with Hastings on board the steamer Karteria, and was in the actions of Piræus, Oropos, Volo, and others. He was induced by Mavrocordato to organize a regular surgical service, at the head of which he was placed with the title of *archichirurgus*. The Greeks being now threatened with famine, Dr. Howe returned to America to procure help. The greatest enthusiasm seconded his efforts; money, clothing, and provisions to a large amount were contributed; and Howe hastened back to Greece as soon as a vessel could be procured to carry these supplies. He superintended the distribution personally, establishing depots at convenient places. He obtained from the government a tract of land on the isthmus of Corinth, where he established a colony, most of the means for which enterprise came from America. Dr. Howe united in his person the functions of governor, legislator, clerk, constable, and commander-in-chief of the military. In one of his journeys he took the swamp fever, and was obliged to leave the country in the spring of 1830. He visited Switzerland, was in Paris during the revolution of July, witnessed in Brussels the revolution which separated Belgium from Holland, in the winter of 1831 attended lectures in Paris, and in the following summer returned to the United States. He had some negotiations about taking charge of the colony of Liberia, but they fell through. In the autumn of the same year he became interested in the project for establishing an institution for

the blind in Boston. He accepted the charge of it, and embarked at once for Europe, to acquire the necessary information and engage teachers, visiting the schools of France and England for this purpose. While in Paris he was made president of the Polish committee, and undertook to carry and distribute funds for the relief of the detachment of the Polish army which had crossed into Prussia. In the discharge of this duty he was arrested and imprisoned for about 6 weeks by the Prussian government. He was then liberated, and escorted over the French frontier by night. In 1832 the institution for the blind was put in operation, and it has been under the charge of Dr. Howe ever since. His greatest achievement in this institution is the education of Laura Bridgman, the deaf and blind mute. (See BRIDGMAN, LAURA.) Dr. Howe has invented an alphabet for the blind, and has also organized a school for idiots. In politics he has been for many years prominent in the anti-slavery party in Massachusetts. In 1846 he was the free soil candidate for representative to congress from the Boston district, in opposition to Mr. Winthrop, who was elected. Dr. Howe is the author of a "Historical Sketch of the Greek Revolution" (1 vol. 8vo., New York, 1828).—JULIA WARD, an American poetess, wife of the preceding, born in New York, May 27, 1819. She was carefully educated under the superintendence of her father, Samuel Ward, and the range of her studies and of her reading was much wider than is usual with young girls of her age. At an early age she wrote plays and poems, some of the latter of which were published. In 1843 she was married to Dr. Howe, and immediately accompanied him upon an extended tour in Europe. Upon her return she lived some years in Boston, prosecuting her studies in spite of household occupations and the care of her children, but publishing nothing. In 1850 she visited Europe again, and remained absent about 14 months, a considerable portion of this period being passed in Rome. After her return she published in 1854 a small volume of poems called "Passion Flowers." Two years later appeared her second volume, "Words for the Hour." A play by her, called "The World's Own," was brought out in the winter of 1855-'6, and afterward published. In 1858 she published "Hippolytus," a tragedy. During the winter of 1858-'9 she accompanied her husband on a trip to Cuba, of which she has published an animated account.

HOWE, RICHARD, earl, a British admiral, born in 1725, died Aug. 5, 1799. He was the 2d son of Emanuel Scrope Howe, Viscount Howe in the peerage of Ireland, and was educated at Eton, whence at the age of 14 he went on board the *Severn*, then fitting out to join the squadron under Anson, destined to operate against the Pacific coast of Spanish South America. He was promoted in 1745 to the rank of lieutenant, and in the same year, in command of the sloop *Baltimore*, aided the *Greyhound* frigate in defeating two

French vessels of superior force, which were carrying troops and ammunition to the pretender in Scotland. For this exploit he was made a post-captain. In 1755 he joined Admiral Boscawen's fleet under orders to follow the French armament designed for Louisburg, and with his ship, the *Dunkirk*, captured off Newfoundland the *Aleide* and *Lys*, the former a 64 gun ship, an action which helped to precipitate the 7 years' war. He was subsequently engaged in the destruction of Cherbourg and the rescue of the retreating British rear guard at St. Cast, and in June, 1759, aided Admiral Hawke in defeating the French squadron under Conflans at Quiberon bay. Returning to England, he was publicly complimented by George II., and at the conclusion of the war obtained a seat at the admiralty board. In 1765 he was appointed treasurer of the navy, and entered parliament for Dartmouth. Five years later he was promoted to be rear admiral of the blue, and commanded a fleet in the Mediterranean. In 1776 he sailed for North America with the rank of vice-admiral of the blue, and as joint commissioner with his brother for restoring peace. In the latter capacity he made several attempts to secure a peaceful adjustment of the strife between the colonies and the mother country, and expressed sorrow at his want of success, having, in the words of a contemporary, come to America "as a mediator, not as a destroyer." He was variously employed against the American forces for two years, and in Aug. 1778, had an indecisive encounter with a superior French fleet under Count D'Estaing, off the coast of Rhode Island, both fleets being much shattered by a severe storm. In April, 1782, he was made a peer of Great Britain, under the title of Viscount Howe, having since 1758 borne the Irish title of the same grade, inherited from his brother, who was killed at Ticonderoga. In the latter part of 1782 he succeeded, against overwhelming odds, in bringing into the harbor of Gibraltar the fleet sent to the relief of Gen. Eliott, then besieged there by the combined French and Spanish forces. For these and previous services he was, in Aug. 1788, created Earl and Baron Howe of Langar. In 1790 he was put in command of the channel fleet. On June 1, 1794, he gained a victory over the French off the western coast of France, capturing 7 ships of the line, of which 6 were safely brought into Portsmouth harbor. For this exploit he received the thanks of parliament, and the king, who visited his ship, the *Queen Charlotte*, presented him with a valuable sword and gold chain, to which was appended a medal commemorative of the occasion. In the succeeding year he was made admiral of the fleet, the chief distinction in the British navy, and in 1797 a knight of the garter. His last important service was the suppression of the dangerous mutiny in the fleet at Spithead in 1797. Shortly afterward the infirmities of age compelled him to retire from active duty, and he died of an attack of the gout. In person Lord Howe was

tall and well proportioned, of a grim and even forbidding expression of countenance, and so swarthy of complexion that he was familiarly called by the sailors Black Dick. His coolness, courage, and impartiality invariably inspired confidence in his men, among whom, notwithstanding a natural reserve of manner and strict notions of discipline, he was popular. In parliament Walpole says he was "silent as a rock," except when naval affairs were under discussion, when he spoke briefly and to the point. He left a daughter who inherited his baronial honors, and is now represented in the British peerage by his grandson, Richard Curzon-Howe, who was in 1821 created Earl Howe. A memoir of Lord Howe, from his journals and papers, has been published by Sir John Barrow (8vo., London, 1838).—GEORGE AUGUSTUS, eldest brother of the preceding, born in 1724, served as brigadier-general in the first American war, commanded 5,000 British troops which arrived at Halifax in July, 1757, and fell at Ticonderoga, July 5, 1758. In him, it was said, "the soul of the army seemed to expire." The general court of Massachusetts granted £250 for a monument, which that province caused to be erected to his memory in Westminster abbey.—SIR WILLIAM, brother of the preceding, a British general, commander-in-chief of the British forces in America from 1775 to 1778, died in 1814. He commanded the light infantry under Wolfe in the battle on the heights of Abraham (1759). He landed in Boston in May, 1775, as successor of Gen. Gage, retired to Halifax after the evacuation of that town, defeated the Americans on Long island, Aug. 27, 1776, took possession of New York, Sept. 15, directed the movements in the Jerseys and in Pennsylvania, repelled the American attack at Germantown, Oct. 4, 1777, was succeeded by Sir Henry Clinton in May, 1778, and soon after returned to England. Leo characterized him as "the most indolent of mortals."

HOWELL, JAMES, an English author, born near Brecknock, Wales, in 1596, died in 1666. He was educated at Jesus college, Oxford, and passed many years on the continent, as a mercantile agent, as travelling tutor, or in a diplomatic capacity. In 1640 he was appointed clerk to the council at Whitehall, but after the breaking out of the civil war he was thrown into the Fleet, where he languished until after the death of Charles I. After the restoration he was appointed historiographer royal, an office which he retained until his death. Howell's publications number about 40, the greater part as well as the best of them being in prose. His *Epistolaria Eliana*, or "Familiar Letters," first printed in 1645-'55, and of which many editions have appeared, was the second published collection of epistolary literature in the English language.

HOWITT, WILLIAM, an English author, born at Heanor, Derbyshire, in 1795. His parents were members of the society of Friends. Upon leaving school he devoted a number of years to reading and study, and was meditating the

career of an author when he was married in 1823 to Miss Mary Botham, also a Friend. In the same year the two published "The Forest Minstrel and other Poems," their joint production, and for several years the husband and wife coöperated in their literary labors. In 1831 Mr. Howitt published his "Book of the Seasons," his exclusive production. Its popularity, however, was eclipsed by that of the "Popular History of Priestcraft," published two years later, which went through 9 or 10 large editions, and so recommended him to the dissenters and reformers of Nottingham, of which he was then a resident, that he was made one of its aldermen. Disliking the publicity attached to his office, he removed to a quiet village in Surrey, where he wrote "Rural Life of England" (2 vols. 8vo., 1837); "Colonization and Christianity" (8vo., 1838), the publication of which led to the formation of the British India society; the "Boy's Country Book" (12mo., 1839); and the first series of "Visits to Remarkable Places" (8vo., 1839). In 1840 he removed to Heidelberg for the education of his children, and during a residence of two years in Germany published the "Student Life of Germany" (8vo., 1841), a translation of a work written for him by Dr. Cornelius; "German Experiences, addressed to the English" (8vo., 1844), and "Rural and Domestic Life of Germany" (8vo., 1842). After his return to England he resumed his active literary life, and published "The Aristocracy of England" (12mo., 1846); "Homes and Haunts of the British Poets" (2 vols. 8vo., 1847); the "Year Book of the Country;" "The Hall and the Hamlet" (2 vols. 8vo., 1847); and a variety of novels and juvenile tales. In 1846 he became part proprietor of the "People's Journal," a periodical devoted to the interests of the working class. Having lost money in the enterprise, he established "Howitt's Journal," a weekly publication, which, after going through 3 volumes (8vo., 1847-'9), was purchased and merged in the "People's Journal." Both are now extinct. In 1852 Mr. Howitt visited Australia, and spent many months in the gold region, where in company with his two sons he dug for gold. His "Land, Labor, and Gold" (2 vols. 8vo., 1855), published on his return to England, gives a graphic account of his adventures. He has since written some letters on the subject of the transfer of convicts to infant colonies. Among his other works are: "Life and Adventures of Jack of the Mill" (2 vols. 8vo., 1844); "Stories of English Life," written in conjunction with his wife and published in Bohn's "Illustrated Library" (8vo., 1853); and translations of Hothaus's "Wanderings of a Journeyman Tailor" (8vo., 1844), and Ennemoser's "Natural History of Magic" (2 vols. 12mo., 1854), the latter for Bohn's "Scientific Library." He has also projected a life of George Fox, and is now engaged upon a "History of England," which is published in weekly numbers to the amount of 100,000 copies, and

which will probably employ him for several years to come. He and his wife have become believers in spiritualism, in support of which they have published statements.—MARY BOTHAM, wife of the preceding, an English authoress, born in Uttoxeter about 1804. She is descended on the father's side from an ancient family of Friends, and her life, until her marriage with William Howitt, was passed in retirement. Since then her history has been nearly identical with that of her husband, in conjunction with whom she published her earliest works, and whom she has accompanied in all his travels, except to Australia. While the family were domiciled in Germany she cultivated the German, Swedish, and Danish languages and literature, and to her studies in the two latter we are indebted for translations of the best works of Frederika Bremer and Hans Christian Andersen, which gained great popularity in England and the United States. Her published writings of all kinds are probably as numerous as those of her husband. In 1847 an edition of her poems was published under the title of "Ballads and other Poems," and since that time she has been a steady contributor of fugitive pieces in prose and verse to a variety of periodicals. Her first novel, "Wood Leighton" (3 vols. 8vo., 1836), which, in contrast to the ordinary works of fiction of the day, sought to establish an interest in the aspects of country life, met with a decided success. Her stories for children have passed through many editions, and the series entitled "Tales for the People and their Children," addressed to the laboring classes and intended to illustrate the dignity of labor, is very popular in England. Her studies in Scandinavian literature led her to compile, in conjunction with her husband, a "History of the Literature and Romance of Northern Europe" (2 vols. 8vo., 1852), including specimens in prose and verse.—ANNA MARY, a daughter of William and Mary Howitt, has of late years appeared before the public both as artist and author. Her "Art Student in Munich" (2 vols. 8vo., 1853) is one of the freshest and truest pictures of German domestic life recently published. Her "School of Life," first published in the "London Illustrated Magazine of Art," records her experience as an artist. In 1859 she married Mr. A. A. Watts, son of the poet of that name.

HOWITZER (Germ. *Howitzze*), a form of ordnance, attached to a carriage and used in field service for throwing shells; first made in Germany, after the introduction of the mortar, and improved by the Dutch and English. Howitzers are short and light, especially adapted for mountain and active service in the field. Compared with the 24-pounder gun of 18½ calibers, which in the English service weighs 48 cwt. and is charged with 8 lbs. of powder, the 24-pounder howitzer weighs 12½ cwt., and is charged with 2½ lbs. of powder. So the 8-inch shell gun of 13 calibers weighs 65 cwt., and the 8-inch howitzer only 20 cwt. Chambers are provided for the reception of the cartridge of less

diameter than that of the bore of the piece where the ball or shell is received.

HOWTH, HILL OF, a peninsula of Ireland, co. of Dublin, forming the N. boundary of Dublin bay. It is a rocky and picturesque elevation, rising to the height of 563 feet, 3 m. long and 2 m. broad, having at its extremity a lighthouse. Howth gives the title of earl to the family of St. Lawrence, the descendants of its Anglo-Norman conquerors. On June 1, 1852, a submarine telegraph was laid from Howth to Holyhead. A harbor of 52 acres has been formed by government at Howth at a cost of £500,000.

HOYLE, EDMUND, an English writer on games, born in 1672, died in 1769. So generally is his principal work accepted as authority in card playing, that "according to Hoyle" has become a proverb. There have been a great many editions of his book, among the latest of which are "Hoyle's Games, Improved and Enlarged by G. H." (London, 1853), and "Hoyle's Games made Familiar," by Eidrah Trebor (London, 1855).

HOYT, GEN. EPAPHRAS, an American historical and antiquarian writer, born in Deerfield, Mass., Dec. 31, 1765, died there, Feb. 8, 1850. Much of his life was passed in perfecting the volunteer and militia systems of the country. He published "Military Instructions," "Cavalry Discipline," and a valuable historical work entitled "Antiquarian Researches;" beside which he left completed with maps for publication a work to be entitled "Burgoyne's Campaigns," and had partially finished a history of the French and Indian wars. He held many civil as well as military offices, among the latter that of major-general in the militia of Massachusetts, and received an appointment in the U. S. army under Gen. Washington, which circumstances compelled him to decline.

HOYT, RALPH, an American clergyman and poet, born in New York in 1810. His earlier life was passed in the country, on Long island. After receiving a good education, he was for some years engaged in mechanical pursuits, and afterward became well known as a teacher, and as a contributor to several magazines and newspapers. Having studied theology, he was ordained presbyter of the Protestant Episcopal church in 1842, and in 1846 became rector of the church of the Good Shepherd, organized in consequence of his arduous missionary labors. His principal works are: "The Chant of Life, and other Poems" (1st part, New York, 1844; 2d part, 1845); "Sketches of Life and Landscape," a new edition of which, with additions, was published in 1858, the proceeds of whose sale were devoted to the rebuilding of his church, destroyed by a tornado.

HUACA, a Peruvian word, signifying thing sacred, a temple, sepulchre, or any thing wonderful, applied particularly to the manticular tombs, sepulchral mounds, or cairns of distinguished personages. Among the Peruvians all historical persons, remarkable for their inventions, or for having in any way ameliorated the condi-

tion of mankind, were the recipients of a certain kind of hero worship, generally local. Few if any had temples, their shrines being generally their tombs, called *huacas*. The Peruvians made sacrifices to the huacas, which were supposed to respond to petitions and questions supported by appropriate offerings made in a proper spirit. The inner chambers of these oracular tombs were sometimes inhabited by priests; and generally they seem to have been devices whereby an inferior class of priests obtained their support. A Frenchman established himself in one near Limatamba, with great success, as late as 1573, when he was taken out and burned by the inquisition. Nearly every one of the huacas of a district or province had peculiar attributes, and was consulted for special objects by a particular class of persons. The silver workers of a district had their huaca, the potters theirs, &c. Some were of great extent, and erected over the remains of the incas, who were entitled to divine honors after death, and over the chiefs of provinces. In accordance with an invariable custom, the wealth of these high personages was buried with them. As a consequence, the violation of their tombs was commenced soon after the conquest, and was prosecuted by the Spaniards with all the zeal and energy that avarice inspires. From some of them vast treasures were taken. A single huaca among the ruins of Chimu, near the port of Truxillo in Peru, opened in 1563 by one Garcia Gutierrez of Toledo, afforded so large a treasure of gold and silver, that he paid 85,547 castellanos of gold, as the royal 5th, into the treasury of Truxillo. But he did not obtain the whole of it, for in 1592 it was again opened, and 47,020 castellanos of gold paid into the treasury, in the form of the royal 5th. So it seems that not less than 677,600 castellanos of gold, equal to \$931,000, were taken from this single huaca. The name huaca, as applied to aboriginal graves, gradually became extended to the provinces adjacent to Peru on the north, where they were also found to contain more or less of treasure. Herrera informs us that in the ancient province of Zenu, a little to the southward of Chagres, "the Spaniards found abundance of graves, some of them so ancient that they were covered with tall trees, and within them was found an immense quantity of gold, beside what the Indians had taken out." Lately the name has become familiar in connection with certain Indian graves in the district of Chiriqui, province of Veraguas, whence a variety of golden ornaments and images have been obtained by Americans and local adventurers. It seems that the accounts given of these discoveries were greatly exaggerated, and that the graves are neither so numerous nor so rich as they were represented in the statements at first made. The various articles found in them coincide exactly in character with those which Columbus and his followers describe as in common use among the Indians whom they encountered on the coast of Veraguas.

HUASTECAS, or GUASTECAS, the name of an interesting aboriginal family which, at the time of the discovery, occupied the country around the mouth of the Panuco river in Mexico. They spoke a dialect of the same language with the people of Yucatan, Chiapas, and Guatemala generally, of which they seem to have been an offshoot or colony. According to tradition, they reached the mouth of the Panuco by sea from the eastward, and there have not been wanting fanciful writers who have sought to identify them with the Phœnicians or Carthaginians. They were dressed, says Torquemada, in flowing robes, like the Turks, which exposed the throat, and had short and broad sleeves. They were industrious and peaceable, and when they penetrated into the country, they did so without collision with the people whom they found in occupation. They finally reached Tulha, and afterward Cholula, where they erected a great temple, the remains of which are visible to this day in the form of the great pyramid of Cholula. At their head was a personage, combining the offices of priest and law-giver, named Quetzalcoatl, who, after a life of beneficence, disappeared in the direction of Guatemala, where he went, as he said, to visit the seats of his ancestors. Both Quetzalcoatl and his followers were great artificers, skilled in cutting precious stones and working gold and silver, and were called Tultecatl, a name which came to signify architects or skilful men, and in our days has been corrupted into Toltec. Quetzalcoatl (a Mexican name, signifying literally feathered serpent, or serpent decorated with the plumes of the *quetzal* or *trogan resplendens*) was adored by the Cholulans after his death or departure as a god, and temples or altars were raised to him in other parts of the Mexican empire. The probability, deducible from concurrent traditions and established philological and other facts, seems to be that a colony from Yucatan or Chiapas, perhaps the remnants of the inhabitants of Nachan or Palenque, emigrated by sea to the mouth of the Panuco, whence they spread to the place called Tulha, and afterward, under their elective or hereditary leader, who combined the characters of "prophet, priest, and king," to Cholula. Leaving his people there, and acting perhaps under the pressure of hostile neighbors, this leader subsequently returned to Huehuetollan, or the old-old Tolha, the seat of his ancestors, somewhere in Central America. The name Quetzalcoatl is only a translation into the Mexican language of Cuculcan, the name of the corresponding demi-god of the Central American nations. It should be explained, however, that the designation of Quetzalcoatl, like that of Pharaoh among the Egyptians, was probably borne by a succession of priestly and political functionaries, and that a number of such chieftains intervened between the landing of the Huastecas at Panuco and the final departure of the ultimate Quetzalcoatl for the "land of his fathers." The Huastecas of Panuco were

reduced under the Aztec or Mexican authority by Netzahualcoyotzin, king of Tezcuco, in 1440. A grammar and brief vocabulary of their language was published by the padre Tapia Zentino in 1767, in the appendix of which he recounts a number of their superstitious practices, which are coincident with those still perpetuated among the Indians of Guatemala. Various sculptured statues or monoliths of stone have been found on the Rio Panuco, which also sustain a certain relationship with those of Central America, whence it may now be considered as established that the greater part of what is called Mexican civilization was derived.

HUBBARD, WILLIAM, an American divine and historian, born in England in 1621, died in Ipswich, Mass., Sept. 14, 1704. He was graduated at Harvard college in 1642, and was ordained about 1656 as minister at Ipswich, where he continued during the remainder of his life. He is the author of "A Narrative of the Troubles with the Indians from 1607 to 1677, with a Discourse" (4to., Boston, 1677), the map accompanying which is supposed to be the first executed in America; he left also in manuscript a general history of New England, for which the colony paid him £50, and which has been consulted with advantage by Mather, Hutchinson, Holmes, and other American historians and annalists. It was published by the Massachusetts historical society in 1815 (8vo., Cambridge).

HUBBARDTON, a township of Rutland co., Vt., noted for a battle between the British and Americans, July 7, 1777. The American army under Gen. St. Clair having been forced to evacuate Ticonderoga, July 6, their main body marched through Hubbardton to Castleton, leaving a rear guard of 1,000 half equipped men under Cols. Warner, Francis, and Haile, to wait at Hubbardton for the stragglers. Here on the following morning they were overtaken by about double their number of British commanded by Gen. Fraser. The battle began at 7 A. M. The impetuous charge of the Americans at first forced the enemy to give way, but they soon formed again, while at the same time Col. Francis was mortally wounded, his men fell back, and Gen. Riedesel appeared on the field with a heavy reinforcement for the British. This decided the fate of the day, and Warner was obliged to retreat, leaving 30 of his men killed and 294 wounded and prisoners, while the British acknowledged a loss of 183 killed and wounded, or, according to Ethan Allen, of 300. Col. Haile withdrew from the field with 300 men without coming into action, but was subsequently made prisoner. He demanded a court martial to investigate the charge of cowardice brought against him, but died in captivity before it could be held. A monument on the battle field was inaugurated July 7, 1859.

HUBER, FRANÇOIS, a Swiss naturalist, born in Geneva, July 2, 1750, died in Lausanne, Dec. 21, 1831. At 15 years of age a too close devotion to the study of the natural sciences, which he had followed from childhood, affected his

health and eyesight, and he was taken to Paris for medical treatment. His health was soon restored, but the disease of his eyes was pronounced incurable, and he soon after became totally blind. Fortunately before that time he had won the affections of a young lady, Mlle. Lullin, who, notwithstanding his misfortune, and against the remonstrances of her parents, willingly married him, and until the close of his life was unremitting in her devotion to him. Being left by his father in comfortable circumstances, he forthwith resumed his investigations in natural science, in which he was aided by his wife, and a faithful attendant named Burnens, who ultimately became his reader and amanuensis. He had previously given much attention to the habits of bees, and believing that many of the statements of Réaumur and Bonnet on the subject were erroneous, he proceeded, with the assistance of his wife and attendant, to make a vast number of original observations, which, having been digested and systematically arranged by him, were first published in his *Lettres à Ch. Bonnet* (1792). The work was reprinted in 1796, and again in 1814, under the title of *Nouvelles observations sur les abeilles*, both times with important additions. The last edition contained his *Mémoire sur l'origine de la cire*, in preparing which he was assisted by his son, Pierre Huber. The impregnation of the queen bee, and many other important facts in the economy of the bee hive, were first made known in this work, which from its intrinsic merits, as well as the unusual circumstances under which it was prepared, made Huber's name famous throughout Europe, and which for general information on the subject has never been superseded. Subsequently, with the co-operation of Senebier, he produced a *Mémoire sur l'influence de l'air et des diverses substances gazeuses dans la germination des différentes plantes* (Geneva, 1801). He endured his blindness with patience and cheerfulness, and to the close of his long life was devoted to his favorite scientific studies. His son Pierre, who inherited much of his enthusiasm in the cultivation of natural science, published a number of valuable papers on ants, butterflies, bees, &c. He died in 1840.

HÜBNER, JOSEPH ALEXANDER, an Austrian diplomatist of plebeian origin, born in Vienna, Nov. 26, 1811, was educated at the university there, and was patronized by Metternich, who in 1833 employed him in the state paper office. Having shown some ability and much loyalty for the house of Hapsburg in various consular and diplomatic capacities, he was intrusted in March, 1849, with a mission to Paris, and appointed in September extraordinary ambassador. In 1853 he was raised to the rank of baron. He signed the treaty of Paris, March 30, 1856, and was formally accredited as Austrian envoy at the court of Napoleon III. on May 22. His unfavorable reception by the emperor on New Year's day, 1859, was the signal of the rupture between France and Austria, and of the Italian war.

Hübner withdrew from Paris in the following spring; and in July he was appointed Austrian ambassador in Rome.

HÜBNER, KARL, a German painter, born in Königsberg in 1814. He is a disciple of the Düsseldorf school, and excels in *genre* pictures of a reformatory tendency. Several of his works have been brought to the United States.

HÜBNER, RUDOLPH JULIUS BENNO, a German historical painter, born in Prussian Silesia in 1806, studied in Berlin under Schadow, and followed his master to Düsseldorf in company with Hildebrand and Lessing. Among his earlier works were illustrations of Goethe's ballad of the "Fisherman," and "Orlando delivering Isabella," after a scene in Ariosto's epic. His "Simeon" and his "Christ and the Evangelists" (1835) show a further progress of his talent; and noticeable among his more recent works are "Job and his Friends," "Felicitas and Sleep," after Tieck's "Octavianus," and several others. He has also gained a high reputation as a painter of cartoons and portraits. He has been a resident of Dresden since 1839, and professor at the academy there since 1841. At the Brussels exhibition of 1851 he received the great gold medal for a picture representing the golden age.

HUC, ÉVARISTE RÉGIS, a French Catholic missionary, born in Toulouse, Aug. 1, 1813. He studied theology in his native city, and taught in the seminary there for a while, after which he entered the order of Lazarists, and was ordained priest in Paris in Feb. 1838. Resolving to devote himself to the Chinese missions, he set sail from Havre a few days after his ordination, and reached Macao about the month of August. He passed 18 months in the Lazarist seminary at this place, preparing himself for the work he was about to undertake, and in the early part of 1840, shaving his head with the exception of the queue which he had carefully cultivated since his arrival, dyeing his skin, and putting on the Chinese costume, he started from Canton for the interior of the empire. After directing a Christian mission in the southern provinces, he went to Peking, where he perfected himself in the Chinese language, and subsequently established himself at He-Chuy (valley of Black Waters), in Mongolia, just north of the great wall and not far from Peking, where there was a considerable population of Chinese Christians. He visited various parts of Mongolia, and devoted all his leisure to acquiring the dialect of the country, and translating into Mongol several little books of prayer and instruction. In 1844 the vicar apostolic of Mongolia directed M. Huc and another French Lazarist, Joseph Gabet, to make a journey through the vicariate, for the purpose of ascertaining its extent and studying the character and manners of the Tartars. Adopting the costume of the Tibetan lamas or priests, and accompanied by a young lama convert named Samdachiemba, they set out in September, travelling S. W. along the Mongolian side of the great wall. Their caravan consisted of a horse, a mule, and 3 camels.

Their only guides were a map and a compass. At night they slept in tents, and their food during 18 months was generally confined to tea and a little meal. After a few days' journey they arrived at the city of Tolon-noor, where they completed their outfit. At the large new town of Chagan-kouren they crossed the Hoang-ho river and entered the sandy steppes of the Ortous country, where they suffered for want of water and forage. While crossing this desert, hearing that a lama of the Buddhist convent or lamasery of Rache-churin was to cut himself open, take out his entrails, and then in a moment resume his former sound condition, the missionaries, who attributed this feat (not an uncommon one, they were told, in those parts) to the action of the devil, resolved to be present and publicly forbid it in the name of Jesus Christ; but fortunately for their own lives, they lost their way and did not arrive in time. Crossing the Hoang-ho again with great difficulty at a season of inundation, they entered the N. E. part of the Chinese province of Kan-su in the early part of November, and remained two days at a frontier town. In Jan. 1845, they reached Tang-keou-eul, on the boundary between Kan-su and the territory of Koko-nor. From Lha-ssa, the capital of Thibet, their point of destination, they were yet distant 4 months' journey across a desert utterly uninhabited except by robbers. They consequently resolved to wait here 8 months for the arrival of a Thibetan embassy on its way home from Peking, under whose escort they might travel in safety. During their stay they studied the Thibetan language and Buddhist books with the assistance of a teacher, and after a while they were invited to take up their abode in the famous lamasery of Koun-boum, about 30 m. distant. In this establishment, which numbers about 4,000 lamas, they remained 3 months, treated, as they were in all parts of Mongolia, with great kindness. At the end of that time they removed to Chogortan, a summer establishment belonging to the lamasery. Toward the end of September the embassy arrived, and having laid in a stock of provisions, purchased a camel and a horse, and engaged another servant, the missionaries joined the caravan, which consisted of 2,000 men and 3,700 animals. In crossing the desert and climbing the snow-covered mountains over which their route led them, they suffered the most terrible hardships. M. Gabet fell ill and was every moment expected to die, but they were obliged to press on with the sick man fastened to his camel. At last, Jan. 29, 1846, they entered Lha-ssa and hired rooms at a wretched lodging house where there were 50 other lodgers. After a few days they were summoned before the *kalon* or regent, the real ruler of the country under the nominal supremacy of the grand lama, who received them well, gave them a residence of his own, and allowed them to preach and set up a little chapel. The Chinese ambassador, Ke-shen, the distinguish-

ed statesman, who had conducted the negotiations with the British at Canton in 1840-'41, soon interposed on political grounds, and in spite of the regent's protection had sufficient power to cause them to be conveyed to Ching-tu-fou, capital of the Chinese province of Se-chuen, and their neophyte Samdachiemba to be sent back to his own country. MM. Huc and Gabet left Lha-ssa March 15, and travelled in palanquins with great state, having a mandarin and a body of soldiers for escort. They wore the richest Chinese robes, and insisted upon putting on the yellow cap and red girdle reserved for members of the imperial family. These precautions had their due effect, and they were treated throughout their journey with profound respect. Their expenses were defrayed by government. At Ching-tu-fou they were put on trial, and it was resolved to send them to Canton. The rest of their journey was performed in the same state as the former part, sometimes over land, sometimes on the Yangtse-kiang and other navigable rivers. Their incessant conflicts with the mandarins, in which the amusing effrontery of the shrewd missionaries never failed to baffle Chinese trickery, give to the narrative of this part of their travels all the interest of a comedy. On one occasion, when a Christian had been arrested for an imaginary crime, they not only insisted upon entering the court room, but actually usurped the judge's seat and conducted the trial themselves amid the plaudits of the people. In Oct. 1846, they arrived at Canton and proceeded to the Dutch factory, where their escort left them. Two days afterward they went to the Lazarist seminary at Macao. Here M. Huc remained between 2 and 3 years, occupying his leisure in arranging for publication his notes of travel. M. Gabet returned to Europe in November, and thence proceeded to South America, where he died soon afterward at Rio Janeiro. In 1849 M. Huc set out for Peking, intending to revisit the missions in Mongolia; but an inundation obliged him to remain 6 months at a Christian station in the province of Che-kiang, and shortly after his arrival at the capital the shattered state of his health induced him to return home. He sailed from Macao Jan. 1, 1852, visited Ceylon, India, Egypt, Palestine, and Syria, and landed at Marseilles in June of the same year. He subsequently fixed his residence in Paris. His *Souvenirs d'un voyage dans la Tartarie, le Thibet et la Chine* appeared in 1852 (2 vols. 8vo., Paris), and was translated into English by William Hazlitt the younger (London, 1852). This work is not only one of the most interesting books of travel which have been written during the present generation, but is stored with valuable information with regard to the history, inhabitants, and geography of the previously almost unknown region of Mongolia. The *Empire Chinois* (2 vols. 8vo., 1854; English translation, 2 vols., London, 1855) relates the adventures of the missionaries during their journey from Lha-ssa to Canton. It is

written in an attractive style, enlivened with much humor, and a large part of it is devoted to a general account of the manners, customs, government, laws, and internal condition of the Chinese empire, which no recent European travellers have had so good opportunities for observing as MM. Huc and Gabet. In 1857 M. Huc published *Le Christianisme en Chine*, which has also been translated into English (2 vols. 8vo., London, 1857).

HUCKLEBERRY. See WHORTLEBERRY.

HUDDERSFIELD, a market town and parliamentary borough of England, in the W. riding of Yorkshire, on the Colne, 35 m. S. W. from York, and 204 m. by railway N. N. W. from London; pop. in 1851, 30,880. It is one of the chief seats of the woollen manufacture in England, of which nearly every variety is produced. It has an extensive cloth hall, where a fair is held each Tuesday attended by upward of 600 manufacturers. There are also cotton mills, breweries, chemical works, and dye houses. Huddersfield sends one member to parliament.

HUDSON, a N. E. co. of N. J., bounded E. by the Hudson river and New York bay, S. by Passaic river, Newark bay, and the Kills, and W. by Passaic river; area, 75 sq. m.; pop. in 1853, 41,823. It has a diversified surface, rising into hills on each side of the Hackensack river, which flows E. through the county. The productions in 1850 were 37,155 bushels of Indian corn, 32,885 of potatoes, 9,673 of oats, 3,663 of wheat, 4,161 tons of hay, and 49,891 lbs. of butter, beside nearly \$100,000 worth of garden vegetables. There were 10 factories and machine shops, 21 churches, 2 newspaper offices, and 1,641 pupils attending public schools. Limestone, copper, and magnetic iron ore are found. The Ramapo and Paterson and the New Jersey railroads and the Morris canal pass through the county. Capital, Jersey City.

HUDSON, a city and the capital of Columbia co., N. Y., situated on the E. or left bank of the Hudson river, at the head of ship navigation, 116 m. above New York city and 29 m. below Albany; pop. in 1855, 6,720. It is beautifully situated on rising ground, and presents a highly picturesque appearance, especially when seen from the river at a distance. A slate bluff rises abruptly from the water to a height of 60 feet, whence a ridge slopes upward for $1\frac{1}{2}$ m., terminating in Prospect hill, 500 feet above the river. The principal street runs along this ridge, from Prospect hill to a public square laid out on the summit of the bluff. The city is a terminus of the Hudson and Boston railroad, and an important station on the Hudson river railroad. It has regular steamboat communication with Albany and New York. The wharves are built on two bays at either side of the public square, and are accessible by large ships. It is said that at one time Hudson owned a larger amount of shipping than New York. It was made a port of entry in 1795, had an extensive commerce with the West

Indies and Europe, and owned a number of whaling and fishing vessels. Its commerce was destroyed during the embargo and the war of 1812, and although the whaling business was resumed it has since been entirely abandoned. Its trade, however, is still important, the principal article of export being pressed hay for the New York market. The chief manufactures are iron and clothing. The Hudson iron company and the Columbia iron works together turn out from 60 to 75 tons of pig iron per day. There are 2 machine shops, 2 iron foundries, a stove foundry, a manufactory of cutlery, a grist mill, a brewery, and a brick yard. The principal public buildings are the court house, a handsome marble and limestone building, 116 feet long and 60 feet high, surmounted by a dome and faced by an Ionic portico; and the city hall, a brick edifice, occupied in part for shops. The city also has 11 churches (1 Baptist, 1 Episcopal, 2 Friends', 3 Methodist, 1 Presbyterian, 1 Reformed Dutch, 1 Roman Catholic, and 1 Universalist), an orphan asylum, supported mainly by voluntary contributions and maintaining from 40 to 60 children, 2 academies, 4 public schools attended by 1,095 pupils, 11 private schools, 2 public libraries, 3 banks, and 3 newspaper offices. A lunatic asylum was established here in 1832, but given up on the opening of the state asylum at Utica. Hudson is supplied with water brought in iron pipes from a spring 2 m. distant. The streets are regularly laid out, all except those fronting on the river crossing one another at right angles. A steam ferry connects the city with Athens on the opposite bank of the river. Hudson was settled in 1783, and was originally known as Claverack Landing. It was incorporated as a city in 1785.

HUDSON, a river of New York, and one of the most beautiful and important in the United States. Its remote sources are in the Adirondac mountains, in the N. E. part of the state, more than 4,000 feet above the sea. Its principal head streams rise in Hamilton and Essex counties, serving as the outlets to a great number of small highland lakes. Several of these streams unite in the S. W. part of Essex co., and the river formed by their junction flows in a tortuous course S. E. to about the centre of Warren co., where it receives the outlet of Scroon lake on the E., 8 or 10 m. W. of the S. part of Lake George. It runs from this point nearly S. to the town of Corinth, on the boundary between Warren and Saratoga counties, receiving on its way the Sacandaga river from the W. and some smaller streams, and then turns sharply to the E., following that general direction with several bends until it reaches Glen's Falls, where it has a fall of 50 feet. Soon after passing this point it sweeps around to the S., and flows in that direction with little deviation to its mouth, a distance of about 190 m., separating Washington, Rensselaer, Columbia, Dutchess, Putnam, Westchester, and New York counties on the E., from Saratoga, Albany, Greene, Ulster, Orange, and Rockland counties,

and the state of New Jersey, on the W. From Glen's Falls to Troy its course is much broken by rapids, but at the latter place, 151 m. from its mouth, it is affected by the tide and becomes a broad, deep, sluggish stream. From Albany, 6 m. below Troy, its general width is from 300 to 700 yards, though it greatly exceeds this in certain places. Its banks are elevated and picturesque throughout nearly its whole course. The upper part of the river is bordered by gentle eminences, covered with cultivated fields, interspersed with pleasant towns and villages, while in Greene and Ulster counties its valley is bounded on the W. by the Catskill mountains, which in the former approach within 7 m. of the river. A short distance below Newburg, 61 m. from New York, it begins its passage through the beautiful hills called the highlands, which rise abruptly from the water; in some places vessels following the channel pass so near the shore that one can almost touch the cliffs from their decks. The most remarkable of these hills are Break-Neck (1,187 feet in height), Beacon, so named from the signal fires which used to burn on its summit during the revolutionary war (1,685 feet), Butter (1,500 feet), Crow Nest (1,428 feet), Sugar Loaf mountain, Bull hill, Anthony's Nose (1,128 feet), and Dunderberg, or Donderbarrack (the "thunder chamber"). The highlands cover an area of about 16 by 25 m., and the river flows through them with many windings which add greatly to its beauty. In the midst of them, on a bold promontory commanding magnificent views both N. and S., is West Point, the seat of the U. S. military academy. Fort Putnam, the ruins of which remain, was built here during the war of independence by the Americans, and a chain was stretched across the river at this place to prevent the passage of British ships. Several other sites memorable in the history of that period are pointed out to tourists in various parts of the river. Shortly after emerging from the highlands the Hudson widens into the expanse known as Haverstraw bay, immediately below which is Tappan bay, extending from Teller's Point to Piermont, about 12 m. long and 3 to 4 m. wide. On the W. shore a range of trap rock called the Palisades rises perpendicularly from the water's edge to a height of from 300 to 500 feet, extending from the New Jersey boundary just below Piermont to Fort Lee, 9 m. from New York bay, the range being thus about 15 m. long. From this place to its mouth the Hudson is between 1 and 2 m. wide. It falls into New York bay in lat. 40° 42' N., long. 74° 1' 30" W., its whole length being a little over 300 m., and its fall 147 feet within the last 156 m. On the E. side of its mouth lies New York city, on the W. Jersey City and Hoboken. The Hudson has few tributaries, the largest being the Hoosic, Mohawk, Walkill, and Croton. Spuyten Duyvil creek connects it with the Harlem river, which flows into the East river, forming the N. boundary of Manhattan island. The basin of the Hudson occupies about $\frac{1}{3}$ of the E.

border of the state, and a large part of the interior. The principal cities and towns on its banks are Lansingburg, Troy, Hudson, Poughkeepsie, Peekskill, Sing Sing, Tarrytown, Yonkers, and New York on the E., and Waterford, West Troy, Albany, Catskill, Kingston, Rondout, Newburg, Haverstraw, Piermont, Hoboken, and Jersey City on the W. It is navigable by ships to Hudson, by steamboats to Troy, and by sloops, by means of a dam and lock, to Waterford, at the mouth of the Mohawk. The passenger steamers from New York to Albany and Troy are noted for their elegance and fine proportions. A little below Albany the navigation is at times obstructed by shifting sands called the Over-slaugh, for the removal of which large expenditures have been ineffectually made by the U. S. government. New York is indebted for much of its prosperity to this river, which forms one of the principal channels of communication between the East and West, and is connected with the great lakes by the Erie canal, and the New York and Erie and New York central railroads, with Lake Champlain and Canada by canal and railroad, and with the Delaware river and the Pennsylvania coal region by the Delaware and Hudson canal. The Hudson river railroad runs along its E. bank from New York to Troy. The total value of property sent from the seaboard by way of the Hudson river is about \$100,000,000 a year, and the value of property exported through it from the interior is about \$75,000,000.—In 1524 Verazzano, sailing under a commission from Francis I. of France, entered the bay of New York and sailed a short distance up the river in a boat. Henry Hudson discovered it, Sept. 11, 1609, explored it above the mouth of the Mohawk, and called it "river of the mountains." This name was soon changed to Mauritius, in honor of the prince of Nassau, and about 1682 it was generally known as the North river, to distinguish it from the Delaware or South river. The term Hudson's river had been applied to it by the English not long after its discovery in 1609. The Indians are said to have called it Shatennuc and Cahohatatea. The first successful attempt at steam navigation was made on the Hudson by Robert Fulton in 1807.

HUDSON, HENRY, a British navigator and discoverer, born about the middle of the 16th century. He was first employed by a company of London merchants to search for the N. W. passage in 1607, when he sailed in a small vessel with a crew of only 10 men and a boy to the E. coast of Greenland, lat. 80°, where he was stopped by ice. After 3 months of fruitless exploration he returned to England, whence he sailed again, April 21, 1608, hoping to find the passage between Nova Zembla and Spitzbergen, but was again hindered by ice, not being able to get to the eastward of the former land. On April 6, 1609, he began another voyage to the N. E. of Asia in the service of the Dutch East India company; but his crew being unable to endure the climate, he crossed to the American coast, where he discovered the mouth of the river

which has received his name. Having sailed up the river to the head of navigation and explored it in a boat for some miles further, he returned to England. In April, 1610, he began his 4th voyage, passing in June and July through the strait and discovering the bay which now bear his name. Finding, however, that this did not give him an open route, he resolved to winter there and resume explorations in the spring. But a mutiny on the part of his men compelled him to return, and eventually proved fatal to him. On the voyage home, while yet in the strait, he was seized and placed with 8 who remained faithful to him in an open boat, and abandoned. Nothing was ever afterward heard of the daring navigator. "A Collection of Documents forming a Monograph of the Voyages of Henry Hudson," edited, with an introduction, by George Asher, was published in London by the Hakluyt society in 1859.

HUDSON, HENRY NORMAN, an American essayist and clergyman, born in Cornwall, Vt., Jan. 28, 1814. His early youth was passed on a farm; from his 18th to his 21st year he lived in Middlebury as an apprentice at the trade of coachmaking, during which time he prepared himself for college. He was graduated at Middlebury college in 1840, and went to Kentucky, where he remained a year engaged in teaching, an occupation which he subsequently followed for two years in Huntsville, Ala. Having during this time applied himself especially to the study of Shakespeare, he wrote and delivered at Huntsville a course of lectures on the great dramatist, which he subsequently delivered with success in different parts of the country, and finally printed (2 vols. 12mo., New York, 1848). In 1844 Mr. Hudson became a communicant of the Episcopal church, and was ordained to the priesthood by Bishop Whittingham in Trinity church, New York, in 1849. He has since edited the works of Shakespeare (11 vols. 12mo., Boston, 1850-'57), been engaged for a short time in editing the "Church Monthly," and contributed articles to various monthly and quarterly periodicals. He is now rector of the Episcopal church in Litchfield, Conn.

HUDSON, JEFFERY. See DWARF.

HUDSON'S BAY, the largest body of water on the continent of America, lies in British North America, between lat. 51° and 64° N., long. 77° and 95° W. It is exceedingly irregular in shape; its greatest length N. and S. is about 850 m., and its greatest breadth 600 m. Its S. extremity is called James's bay. On the N. E. it communicates with Davis's strait by means of Hudson's strait and Cumberland strait, and on the N. Fox channel opens into it. Opposite the mouth of Hudson's strait lie the Southampton islands. A great number of smaller islands are scattered over the surface of the bay. The coasts are generally bold and indented with many inlets.—The bay takes its name from its discoverer Henry Hudson, who on his last voyage entered it by the strait which has also since borne his name. Following up

his discovery, the English in 1612 fitted out two vessels, provisioned for 18 months, under the command of Thomas Button. Entering the bay, he anchored at the mouth of Nelson's river, on the W. shore, and took possession of the country. After wintering there, Button directed his course S. along the W. coast, to which the name of New South Wales was given. When France was disputing with England the rights claimed in and along the borders of Hudson's bay, some French writers affected to discredit the story of Button's voyage; but its correctness is well established. For over 50 years these discoveries were not turned to practical account. The charter of Charles II., granted in 1670, purported to give to the Hudson's bay company the sole right of trade, commerce, and fishery in the waters of the bay and its tributaries, together with the royalty of the sea within certain limits. The company have exercised control in Hudson's bay, but have not deemed it worth while to keep up any kind of fisheries there. They once had a fishery for the white whale (not much larger than the porpoise) at Richmond harbor, near East Main, James's bay; but 7 of their servants were murdered by the Indians, and the establishment was given up. Although whales frequented the bay in immense numbers in early times, it is now alleged by the company that there is too much ice both in the bay and straits to make fishing profitable. The bay is seldom entirely free from ice fixed or floating, and navigation is not practicable for more than 2 months in the year, allowing of only one voyage. The company's vessels generally arrive about Aug. 10 or 15, and leave by Sept. 25. By the time the vessels leave, the thermometer sometimes falls as low as 16°, and the straits leading to the bay become impracticable by barriers of ice. The inward passage through the straits, in the month of August, takes from 4 days to 5 weeks. There are seals in the straits, but the company makes no attempts to capture them. Within 125 years navigators have described Hudson's bay as containing, in spring and autumn, whales and seals in larger numbers than were to be met with in any other waters. The season of the whale fishery would not last over 9 weeks, from the beginning of June to the middle of August. The French traders used to obtain whale fin, blubber, and oil from the Esquimaux, who, in addition to what they sold, retained a winter's stock for themselves. The navigation of the bay is now so well understood, that for the last 25 years no vessel has been frozen up. In 1836 a vessel with an outward bound cargo had to return on account of the ice. Except the vessels of the company, there are none trading to Hudson's bay.—In 1663 the English had erected Fort Rupert, at the S. E. extremity of James's bay, at the mouth of Rupert river. At two other points they also erected forts. In France and Canada these operations were regarded with a jealous eye. Colbert, though wishing to make good the claims of France to that region, ab-

stained from making any remonstrance or setting up any pretensions on the part of the French crown to the shores of Hudson's bay. But an accident came to the assistance of the minister. Some Indians waited, as a deputation from their tribe, upon M. Talon, intendant of Canada, to ask him to send missionaries to that distant region. It was thought that an easy road to Hudson's bay might be found by way of the Saguenay river; and that if the missionaries were sent by this route, England might be prevented from acquiring any prescriptive rights in that quarter. On Aug. 27, 1671—the year after the charter was granted by Charles II. to the Hudson's bay company—Father Albanel and two Canadians set out on their mixed mission of religion and national ascendancy. News had already reached Canada that two English vessels had arrived in the bay and were carrying on a trade with the Indians. Having wintered at Lake St. John, less than half the distance of their journey, the missionaries continued their voyage by Lake Mistisinnay and Lake Nemiscan. On arriving at James's bay, they went through the form of taking possession of the country in the name of the French sovereign, according to orders, having taken the precaution to assemble as witnesses the chiefs of 10 or 12 nations of Indians. The next year the French sent two vessels to attack the English forts on the bay; and thus commenced a protracted contest for supremacy in that quarter, the main object of which was to secure exclusive possession of the fur trade, which in a few years swelled to very important dimensions. Though the contest was carried on with varied success, the English maintained the footing they had obtained; and the Hudson's bay company have ever since kept possession of the country. The principal depot of the company on Hudson's bay is York Factory, situated at the mouth of Nelson's river, on the W. side of the bay. This river forms the leading highway from Hudson's bay into the vast territory N. of Lake Winnipeg, and westward to the Rocky mountains. From Moose Factory, near the head of James's bay, there is another means of communication into the country. Lake Superior is sometimes reached by this route, in which, for a part of the distance, Moose river is used, the rest of the distance being overland. The north-west company, before its junction with the Hudson's bay company, had depots on two islands, Charlton's and Hayes, in James's bay. Montreal being the head-quarters of the north-west company, and the scene of their operations lying chiefly N. W. of Lake Superior, it was found that Hudson's bay was not an advantageous point for them to trade from; and those stations were accordingly abandoned before the year 1814. It is different, however, with the Hudson's bay company. Their head-quarters is London; and from York Factory their canoes ascend Nelson's river, encountering 84 portages on the passage, directly to Norway House, at the foot of Lake Winni-

peg, the central point of all their operations in the territory.—Early navigators committed the error of supposing that there were two tides in Hudson's bay, one coming from the E. and the other from the W.; that the E. tide did not exert its influence beyond the entrance of the bay. This error, coupled with the fact that there was a tide on the W. side of the bay, led to the belief that it flowed from a western sea, which was supposed to be not far distant. At Port Nelson and Hayes river the tide rises 16 feet. At Albany road there is a full sea under the influence of the moon, and 8 feet at ordinary tide. The same is true of Moose river road, except that the ordinary tide does not rise above 7 feet. These heights do not make allowance for the influence of ice and winds, though in both cases it is considerable. In James's bay, for instance, where the tides are languid, N. and W. winds will bring 12 to 14 feet of water. At Fort York the water sometimes rises to 20 feet. The influence of local attraction deranges the compasses in the neighborhood of Hayes river; the existence of iron ore is said to be the cause. Before the navigation of the bay was thoroughly understood, it was usual to take two seasons for a voyage from England; and the captain who succeeded in returning the same year was awarded a prize of £50.

HUDSON'S BAY TERRITORY, a vast region of British North America, comprising nearly all the British possessions N. and W. of Canada, bounded N. by the polar regions, E. by Labrador, Davis's strait, and Baffin's bay, S. by Canada and the United States; its W. limits are undetermined. The charter under which the Hudson's bay company claim a variety of privileges was granted by Charles II. of England, in 1670, to Prince Rupert, Christopher duke of Albemarle, William earl of Craven, Henry Lord Arlington, Anthony Lord Ashley, Sir John Robinson, Sir Robert Viner, Sir John Griffith, and Sir Philip Carteret, James Hayes, John Kirke, Francis Millington, William Pretymann, John Fenn, and John Portman, and their successors. Its purpose was to encourage the associates to prosecute the search after a new passage to the South sea, and to establish a trade in furs, minerals, and "other considerable commodities." It conveyed to the company a grant of "the sole trade and commerce of all those seas, straits, bays, rivers, lakes, creeks, and sounds, in whatsoever latitude they shall be, that lie within the entrance of the straits commonly called Hudson's straits, together with all the lands and territories upon the countries, coasts, and confines of the sea, bays, lakes, rivers, creeks, and sounds aforesaid," that were not previously granted to or in the possession of any British subjects, or those of any other Christian prince. All mines of gold, silver, gems, or precious stones, discovered or to be discovered, within those territories and limits, were also conveyed to the company. Of the territory they were constituted absolute

proprietors, in free and common socage, saving the faith, allegiance, and sovereignty due to the crown. For all this, the company was to pay yearly to the sovereign two elk and two black beavers; but this only whenever the sovereign should happen to be within the territories granted. The company had power to make laws, constitutions, and ordinances, and to provide pains, penalties, and punishments for their violation. Fines for the breach of laws thus made were to go to the company. There was, however, one limitation to these powers; the laws, constitutions, orders, and ordinances which the company might make, and the fines and amercements which they might impose, were required to be "reasonable, and not contrary or repugnant, but as near as may be agreeable to the laws, statutes, or customs" of the realm. How complete was the monopoly intended to be conveyed by Charles II. may be seen from the stipulation on the part of the king that no other subjects of Great Britain, except the few individuals forming the company, should visit the ports, havens, islands, or territories granted, contrary to the true meaning of the charter, that is, for trading purposes. All other subjects of the crown were expressly forbidden to visit or trade at any of these places, unless specially licensed by the company, on pain of incurring the royal indignation, and the forfeiture of goods which might be taken to or from the territories in question. Offenders might be bound in the penalty of £1,000 not again to trade within the exclusive domain of the company. The company had full power to send vessels of war, with men and ammunition, to any of their forts, factories, or places of trade, for the defence and security of the same, appointing commanders and officers, by commission under their common seal. They had the right of making war or concluding peace with any non-Christian prince or people within the territories covered by their charter. They might build castles, fortifications, forts, or garrisons, and plant colonies, and lay out and build villages or towns. Any persons not members of the company, whether English subjects or not, who should sail into Hudson's bay or enter the company's territories without leave, were liable to be seized and sent to England. The employees of the company were made liable for any offence they might commit to such punishment as the president and council, acting on behalf of the governor and company, should see fit. In case the party convicted should appeal against the sentence, he might be seized and sent a prisoner to England, to be tried by the laws of the nation. The governor and company might examine upon oath any persons in their employment, upon any matter not repugnant to the laws of the realm. Extraordinary as many of these powers and privileges are at the present day, there is not one of them which the company do not still claim the right to exercise. The claim to exclusive trade, though understood to be legally

void, is nevertheless insisted on by the company, and except at a very few points, such as Red river and the Labrador coast, is enforced. In the reign following that in which it was granted, the charter received the confirmation of parliament; but it was specially provided that the act of confirmation should only remain in force for the period of 7 years, "and from thence to the end of the next session of parliament, and no longer." After this no reconfirmation of the charter by parliament ever took place, though its existence has frequently been incidentally recognized in acts of that body. By an act of parliament of Great Britain (43 George III., cap. cxxxviii.), passed in Aug. 1803, it was provided that crimes committed within the Indian territories—which, though not conveyed by charter to the company, have long been leased to them—should be cognizable by the courts of Upper or Lower Canada. The preamble of this act recites that crimes and offences committed within the Indian territories were not cognizable by any jurisdiction whatever. In 1821 an act (1 and 2 George IV., cap. lxvi.) was passed, extending the provisions of the above named act to crimes and offences committed within the territory covered by the company's charter, any thing "in any grant or charter to the company to the contrary notwithstanding." This latter act also gave to the Canadian courts a right of jurisdiction within the Indian territories, as well as over Rupert's Land, which is covered by the company's charter. But the crimes for which this new jurisdiction was provided were to be adjudicated upon according to the laws of England, and not the local statutes of Canada. The Canadian government never availed itself of this act to appoint persons to administer justice in those distant territories. Under this act the company claim a right of concurrent jurisdiction with the Canadian courts, and their claim has been admitted. As the limits of the territory covered by the company's charter are disputable, so necessarily are those of the Indian territory, where it bounds the chartered territory of the company, on the west. Accordingly, in 1821, the British government gave to the late north-west company a license of exclusive trade over the Indian territories, in which their boundaries were very loosely stated. By this grant the exclusive privilege of trading with the Indians was given to William McGillivray, Simon McGillivray, and Edward Ellice, "in all such parts of North America to the northward and to the westward of the said lands and territories of the United States of America, as should form no part of his majesty's provinces in North America, or of any lands or territories belonging to the said United States of America, or any European government, state, or power." On May 30, 1838, the exclusive right of trading with the Indians thus conferred by the above named grant was renewed to the Hudson's bay company for a period of 21 years, this company having acquired the rights of the parties to whom the previous grant had been

made. The consideration was an annual rental of 5s.; the company binding themselves in a penalty of £5,000 to insure, as far as possible, the due execution of all criminal and civil process within the territory, and to give up to justice any of their servants within the territory who might be charged with any criminal offence. They also agreed to submit for the consideration and approval of her majesty the rules which they might frame for the management of the fur trade, the conduct of their servants, and the diminution and ultimate prevention of the sale or distribution of spirituous liquors to the Indians.—At the time of the acquisition of Canada (1760), the Hudson's Bay territory was generally described on English maps as far less extensive than it is now understood to be. The company's territory was then represented in the shape of a horse shoe, with the toe to the south. Commencing at Grimington on the Labrador coast of Davis's strait, near lat. 57° N., the line takes a sweep toward the S. W., coming with but a slight curvature as far as Lake Mistissinny, along the S. E. side of which it skirts; thence curving more directly toward the W., it passes on the dividing ridge between Lake Temiscaming on the S. and Lake Abitibi on the N., after which it reaches its most southern bend between long. 75° and 85° W.; from the latter point it begins to take a N. direction, passing near long. 92° W. about half a degree N. of Lac Sal; continuing its course in a N. W. direction, it crosses Nelson's river a little below its intersection with lat. 56° N.; thence continuing its course, with about the same curve in a N. W. direction. In 1750 the company, called before the lords of trade, gave the S. boundary of their territory at Norway House, on the N. E. corner of Lake Winnipeg, above lat. 54°. Now they claim that their charter covers territory 6° S. of that point. One reason why they make this extended claim seems to be that the Indian territories in 1750 belonged to the French, and could not therefore conveniently be claimed by the company; but by the cession of Canada to England the Indian territory became English, and being unoccupied, the company had an opportunity to extend their claims. When it is considered that they have since claimed all the country, the waters of which run into Hudson's bay, and that nearly all the rivers which traverse the territory, with the exception of the Mackenzie, the Coppermine, and the Black or Great Fish rivers, which flow into the Polar sea, take their rise near the Rocky mountains, and discharge into Hudson's bay, the magnitude of their pretensions will be at once comprehended. The question of the validity of the charter has been much discussed, both in England and Canada, during the last two years. Both Canada and the mother country appear to have been waiting each for the other to initiate legal proceedings. From the circumstance of the crown having granted the charter, there appears to have been a reluctance to make

it the plaintiff in proceedings initiated for the purpose of impeaching the validity of the grant. The law officers of the crown recently suggested a mode by which this anomaly might be prevented: that the Canadian government should proceed by *scire facias* to test the validity of the charter. Such proceedings, it was added, might be taken in the name of any individual subject of her majesty. After full consideration, the Canadian government definitely refused, April 4, 1859, to take the course suggested by the English law officers of the crown. In Jan. 1858, the government of Lord Palmerston proposed to refer the question of the boundaries of the company's territory between Canada on the S. and the Indian territories on the W. to the privy council for decision. In this reference the validity of the charter was to have been taken for granted. Canada, however, declined to become a party to such an inquiry; and the matter fell through. The objection to the decision of the isolated question of boundary was stated, March 9, 1859, by Sir E. B. Lytton, then secretary of the colonies, to be that it would leave the larger question of the monopoly of trade unsettled; for although it is the general opinion among English lawyers that a grant of such monopoly is invalid, yet it is probable that as landlords the company could exclude rival traders from their territory. The company, on Feb. 8, 1859, refused to accept a renewal of the lease of the Indian territories for a period of two years; but they were willing to accept a renewal of the license for 21 years.—Whatever may be the respective boundaries of the Hudson's Bay territory, the Indian territories, and Canada, it will be more convenient here to treat the whole country between the eastern coast of Hudson's bay on the E. and the Rocky mountains on the W., and from the Canadian and U. S. frontier on the S. to the Polar sea on the N. The Rocky mountains have an inclined base on the E. about 150 m. wide, with a summit about 8,000 feet above the sea. Then to the E. comes a sloping belt of prairie land, from 600 to 800 m. wide, called rolling prairie, on which there are occasional bluffs, but neither peaks nor hills of any note; this belt is mostly covered with grass. Going still further to the E., there is next a tract of rocky country, extremely uneven, with mountains 1,000 feet high in places, about 200 m. wide, bounding a chain of lakes which separates it from the prairie land. A small extent of wooded country intervenes between these lakes and the prairies. Between the lakes and Hudson's bay there is a very uneven country, about 200 m. in width, of granitic formation, containing numerous small lakes and swamps, and being of very little value. Except where alluvial spots appear, very little of this belt is suitable for cultivation. For 600 m. W. (though at some points it is less) from Hudson's bay there is a rise of two feet to the mile. Between the lakes and Hudson's bay, about equidistant at some points, is a dividing ridge, whence the waters run E. and W. Northward from about

lat. 56° there is a descent for a distance of about 1,200 m. into the Polar sea. Above this point the descent is rather to the N. than the E.; but the lowest line of N. slope comes down as far as lat. 53° N., which it crosses diagonally, ascending toward the E. At long. 90° W. the N. slope only commences about 50 m. N. of Lake Superior. The Rocky mountains throw out spurs to the E., commencing between the upper branches of the South Saskatchewan and the Pembina. They divide near long. 104° W., the lower one passing below the Beaver river, thence almost due E. to the neighborhood of Duck lake; and the other passing below the lower bend of the Elk river, and across Prairie Portage to beyond Wollaston lake.—There is perhaps no country of which the character and capabilities are so much disputed as this. The actual occupants, who find the fur trade profitable, represent it as unsuited for settlement; and a progressive party, who believe that the interests of civilization require that this vast territory should be put to another use, present the reverse of the medal. According to one party, the prairie country has but a thin covering of earth, and in some places none at all; the grass is scanty and almost eaten up with moss; the alluvial banks of the rivers are flooded at times for miles, and frightful swamps impede the progress of the traveller. According to the other, the whole country, as far as Athabasca lake and Peace river, is calculated to become an earthly paradise; the fine black alluvial soil, on a limestone formation, producing, in the wooded portions, beech, birch, and maple in profusion, and being eminently fitted for cultivation. Dr. King, surgeon and naturalist to the expedition that went in search of Sir John Ross in 1833, goes so far as to say that along "the whole of the Great Fish river, down to the sea [an estuary of the Polar sea] is the finest grazing country in the world." Its alluvial soil, based upon sand, is, he admits, not capable of being rendered arable. Of the region lying between Hudson's bay and the Labrador coast but little is known, and certainly that little is not favorable. The geological structure of this part of the earth has been made known, in its more general features, through the collection of fossils and rock specimens procured by the parties engaged in the several Arctic exploring expeditions. From these it would appear that a belt of azoic rocks, 150 or 200 m. in width, stretches away in a N. W. direction from the shore of Lake Superior until it reaches the coast of the Polar sea, between the mouth of the Coppermine river and long. 95° W. The exact age of these rocks has not been ascertained, but from their lithological characters and geographical position in relation to the Huronian and Laurentian series, it is probable that they belong to these two formations. In that case they would be older than the lower Silurian. Proceeding W., we next have a vast region of an irregular oblong shape, bounded E. by the belt of azoic rocks above mentioned, S. by the

United States, W. by the chain of the Rocky mountains, and N. by the Arctic ocean. The length of this tract is about 1,500 m. and its width 400 m. The whole area appears to constitute an immense plain, of which a large portion is prairie land, and the remainder clothed with forest. Although many small collections of fossils have been brought from different localities in this extensive region, yet for the greater part its geological age is unknown. It has been ascertained that along the E. side there is a margin of silurian and devonian rocks, which are first met with at the lake of the Woods, and have been traced N. W. to Great Bear lake. The fossils collected by the exploring party sent out by the Canadian government in 1857 and 1858 show that on the Assiniboin, 150 m. W. of Fort Garry, there is an exposure of cretaceous rocks, and it is probable therefore that a considerable portion of the territory belongs to that formation. Fragments of lignite are found throughout the whole area and along the W. side, and on the Mackenzie river several beds of the same substance have been discovered. Mr. Hind, who was at the head of the Canadian exploring party, discovered iron ore in large quantities on the upper part of the Assiniboin, yielding from 29 to 32 per cent. of iron. Upon the whole, however, it may be safely said that the great region of the N. W. yet remains a sealed book to the science of geology. On the E. coast, Labrador and East Main are composed principally of the Laurentian formation; but from James's bay around the W. side of Hudson's bay, there is a broad margin of the silurian and devonian rocks, which have been traced all the way to the Northern ocean, and are exposed on the shores of some of the islands between lat. 70° and 75° N. The lignite or tertiary coal has not been used to any great extent; but it is described as being exceedingly disagreeable to burn, from its emitting a large quantity of sulphurous vapor. It is described by depreciators of the territory as unfit to make iron, and incapable of being used in any of the arts. There are true coal fields on Parry's island, in the Arctic ocean, in lat. 74° and 75°.—The whole of this vast extent of territory is well watered by lakes, rivers, and small streams. There are lakes larger than Ontario, and at least one river that might compare with the Mississippi. Of the lakes, Winnipeg is the largest. Situated between lat. 50° and 54° N. and long. 96° and 100° W., it has a length of 264 m., and an average width of 35 m.; area, 9,000 sq. m.; altitude above the sea, 628 feet. By canoe route, it is 616 m. from Lake Superior. To the S. W. of Lake Winnipeg, and connected with it by a navigable channel, is Lake Manitoba. N. of this latter lake, and almost due W. of Lake Winnipeg, lies Lake Winnipegosis, between which and Lake Manitoba there is a navigable connection. Thus is completed the connection between the 3 lakes, all of which have a general direction from N. to S. Their united area probably equals that

of Lakes Ontario and Erie combined. Over the surface of Lake Winnipeg several islands are scattered. An area of 400,000 sq. m. is drained by its tributaries, most of which, for hundreds of miles, are used as canoe or boat routes. Of these the Winnipeg river, 300 m. long, and connecting with the lake of the Woods, is the widest, to the S.; and to the N. the continuation of Nelson's river, which empties into Hudson's bay, forms the main highway of the company into their territory. But the largest tributary of Lake Winnipeg is the Saskatchewan, which, taking its rise in the Rocky mountains, courses for some 1,000 m. along a formation offering few obstructions, and through which it has cut a clear course in its entire length. In this respect, it presents a marked contrast to the E. portion of Churchill river, the next considerable stream to the N., which extends across the country from S. W. to N. E., flowing into Hudson's bay. In many places it consists almost entirely of a succession of lakes, some of which are 15 m. wide. It is studded with myriads of islands, from which, as well as falls, the Saskatchewan is almost entirely free. Running through a primitive formation for a considerable distance from its mouth, the hard crystalline rocks appear to have forced it to take refuge in the most fantastic and abrupt sinuosities. Red river, with a direction nearly due S., enters Lake Winnipeg by 4 different channels; and extending down to about lat. 46°, it overlaps the upper branches of the Missouri and the Mississippi, between which it runs in the opposite direction. The Assiniboin, a branch of Red river, running at first W. and then S. W., is nearly as extensive as the main stem. Several rivers, taking their rise in the E. belt of granitic rock which separates the valley of Winnipeg from Hudson's and James's bays, flow into this lake. Among them are Little Black river, Great Black river, Poplar, Leaf, Beren, and Goose rivers. Reindeer lake lies N. of Churchill river, with which it communicates by Reindeer river, in about long. 103°; its direction is from N. to S.; it is 84 m. long by 36 wide. Into Reindeer lake enter the waters of Wollaston lake by a river connection. Wollaston lake is about 60 m. by 40. Athabasca lake, about 230 m. long and 40 m. wide in its widest part, empties, through the Elk and Clear Water rivers, into Churchill river, near long. 108° W. Clear Water river traverses 3 small lakes in its course, Methye, Buffalo, and La Crosse. Churchill river, W. of its intersection with Elk river, divides into 2 branches, on the upper of which is situated the Lesser Slave lake, a little above lat. 55° N., about 4 degrees of long. E. of the Rocky mountains. Peace river enters into Slave river, in which there are frequent interruptions, just above the N. W. point of Athabasca lake. Its general direction is from W. to E., its sources being W. of the Rocky mountains, through a pass in which its upper branches run; that of Slave river, into which it empties, is from S. to N., terminating in the Great Slave lake. The

current is frequently swift, and the navigation is often interrupted by falls and rapids of a dangerous character. At some places, Mackenzie describes it as "flowing between stupendous rocks, from whence huge fragments sometimes tumble down, and, falling from such a height, dash into small stones with sharp points, and form the beach between the rocky projections." When the waters are high, the navigation is entirely impracticable at several points. In the pass of the mountains, Mr. Kay reports the existence of several chasms, which emitted smoke and heat and diffused a strong sulphurous stench. In long. $120^{\circ} 30' W.$ the mountains along the course of the river are 1,500 feet high in places, though generally not over half that height. In some places the limestone rocks, which give a white color to the water, are entirely destitute of trees; in others they are thickly wooded. The Great Slave lake, about 300 m. long by 50 wide, flows through the Mackenzie river into the Polar sea, a little E. of long. $135^{\circ} W.$ The Great Bear lake, which also flows into the Mackenzie river, lies between lat. $64^{\circ} 30'$ and $66^{\circ} 30'$, and long. $117^{\circ} 30'$ and $122^{\circ} 30'$, being about 200 m. long by 115 m. at its widest point, including Vicar bay, a considerable S. projection. The Great Bear river, through which the water of this lake flows into the Mackenzie river, is about 100 yards wide; its clear waters have the green hue of the sea. Lake Aylmer, which flows into Great Slave lake, through Artillery lake, lies between lat. 63° and 64° , and long. 106° and $110^{\circ} 15' W.$, having a length of 120 m. and a breadth of 38 m. E. of the granitic belt which lies about equidistant from Hudson's bay on the E., and Winnipeg, Deer, Wollaston, and Athabasca lakes on the W., are several smaller lakes: Lake St. Joseph, which flows into James's bay, through Albany river; Cod's lake, which flows through Hayes river into Hudson's bay; Assean lake, which flows through Nelson's river into Hudson's bay; Was-kay-ow-wah-cow lake; Lake Barazan; North Lined lake, which flows through Thlediaza river into Hudson's bay; Lake Theyeholekyed; Lake Maguse, which flows through the river of the same name into Hudson's bay; Lake Yath-kyed, which, together with Dubaunt and Napashish lakes, flows into Chesterfield inlet. This inlet extends from the bay to long. $108^{\circ} 30'$, having a width of about 20 m. Moose river, which falls into James's bay at its S. extremity, is the line of communication used by the Hudson's bay company to Lake Superior. By this route 15 months are consumed in the conveyance of goods, though by the lake route they can be landed at Lake Superior ports in the latter part of May or the first week in June. This route has been considerably improved during the last 40 years. There are several portages between the source of Moose river and Lake Superior. The Albany river, which also flows into James's bay, takes its rise in Lake St. Joseph, near lat. 51° and long. 89° . It drains, according to Devine, an area of 56,160

sq. m. It forms one of the routes of communication between Hudson's bay and the Red river, though there are several portages before Lake Winnipeg is reached. York Factory, at the confluence of Nelson's river, which enters the bay 8 miles above Hayes river, on Hudson's bay, is the company's centre of imports and exports for the N. department of their territory. Norway House, at the foot of Lake Winnipeg, is the central depot of that department. From this point the company's "brigades" of boats start for the Athabasca lake, the Peace, the Mackenzie, the Saskatchewan, and even the Red river and Rainy lake. It is more especially the depot for Athabasca lake and the Mackenzie river. The goods for the latter are sent in by a brigade of boats from the Red river; and leaving Norway House in June, they are met by the Mackenzie river boats at Methye portage, or Portage la Cloche. Here cargoes are exchanged, and the boats from Mackenzie river carry off the stores to Fort Simpson, the head-quarters of the district to which they belong. The Red river boats return with their freight to York during the same season, in time for the furs to be shipped for the London market. The season is barely long enough to make the trip, and have the furs secured in time for shipment before the navigation of Hudson's bay closes. In like manner, the Athabasca supplies are taken from Norway House in the same boats that bring down the furs. Boats are everywhere used for the conveyance of goods, in preference to canoes, except in the Abbitibbe and Temiscaming districts, both of which are Canadian posts of the company. The Churchill and Severn rivers are supplied by boats from York Factory. The Mackenzie is a fine large river, practicable for steamboat navigation the greater part of its length. From its mouth to its source, at the Great Slave lake, it has only one obstruction, and that not material, situated near Fort Hope, about lat. 66° . The bay at the mouth of Mackenzie river, on the Polar sea, is at times approachable from Behring's straits. Franklin passed from the river to the straits; and Patten and others have sailed from the straits to the river. The ice breaks up at Fort Simpson, lat. $61^{\circ} 51'$, about the beginning or the middle of May; and the river is open at its mouth about the end of the month. It closes about October. The floating ice would generally prevent the navigation of even the upper portion of the river before the beginning of June; and the shallow lake at the mouth of the river is sometimes covered with ice, out of the channel, in the middle of July. A shallow at the entrance of the Great Slave lake into Mackenzie river would interrupt the navigation of any kind of craft drawing more than 2 or 3 feet, when the water is low. The S. branch of the river is a mile wide at Fort Simpson, the point where the head streams unite. One of its sources is on the W. side of the Rocky mountains, through one of the passes of which

it forces its way. This branch is called the Liard river. Its current is remarkably strong; and in the early part of summer, on the melting of the snow, its waters rush down upon the Mackenzie with all the force of a mountain torrent. The ice of the latter, resisting for some time, at length breaks by the force of the flood, the noise of the concussion resembling thunder. The broken ice is swept along by the furious current, until it accumulates to such an extent as to dam the river. The country is then overflowed for miles, and the largest trees are washed up by the roots. Fort Hope was once swept away, and its occupants only saved themselves by great exertions and difficulty. The width of the river, in many places, is over a mile; but at one point below the Great Bear river it contracts to a width of 300 yards, for a distance of 3 m. Its length, from its W. source, is about 2,500 m.; and from the Great Slave lake to its embouchure about 1,700. In many places its banks are high without being precipitous, here naked and there covered with verdure. Coppermine river rises near lat. 66° N., and falls into the Coppermine gulf, an estuary of the Polar sea, in long. 120° W., according to Hearne, by whom it was discovered and surveyed. Its breadth varies from 20 to 500 yards. The two sides of the solid rocky banks present a marked correspondence, suggesting the idea that the river was produced by some great convulsion of nature. There are various falls in its course of from 4 to 40 feet each. Numerous small streams flow into it. In the valleys between the hills, patches of good grass are met with, on a stiff loam and clay soil, within 8 m. of the sea. About 30 m. from the sea copper has been found on the Coppermine river, but not in large quantities. Before the use of iron was known to them, the northern or Coppermine Indians used the copper for hatchets, ice chisels, and arrow heads.—The 3 routes from Lake Superior to Lake Winnipeg have lately attracted considerable attention; the Canadian government having in 3 successive years sent out an exploring party into that region. The central or current river route, by Dog lake, Lac des Mille Lacs, and the river Seine, has been more completely explored than the others. An official report of the exploration undertaken by the Canadian government thus divides the distance:

	Land carriage, miles.	Navigable, miles.
From Thunder bay to Dog lake	23	..
Through Dog lake and river to the Prairie portage ..	..	35
Land road past Prairie and Savanne port- ages to Savanne river	5	..
Through Savanne river, Lac des Mille Lacs, and the river Seine to the Little Falls ..	..	65
Broken navigation on river Seine .....	..	59½
Land carriage past the 12 portages on river Seine	7	..
From the Seine to the western extremity of Lac Plat, navigable with only one break at Fort Francis .....	..	203
Thence to Fort Garry by land	91½	..
Total	181½	367½

It is estimated that if certain improvements

were made, the entire distance could be travelled in a little more than 3 days. The Kaministauqua river, which flows into Lake Superior at Fort William, is impracticable for navigation by any larger craft than canoes. The E. or Nipigon route was explored by Sir Alexander Mackenzie; but it does not appear to present any special advantages. It has probably more land and less water than either of the other routes. The Pigeon river or W. route contains 13 portages, one of which is 9 m. long. The route by the Red river (whether that river be approached from Lake Superior or the state of Minnesota) and the Saskatchewan seems destined to become familiar to overland travellers to the Fraser river gold region, parties of emigrants having already begun to test its practicability. At the top of the S. branch of the Saskatchewan is a pass in the Rocky mountains, practicable for horses, and through which a railroad might be constructed. Mr. David Thompson, late astronomer and surveyor to the north-west company, went through it from the E. in 1807. It lies in the same gorge in which Capt. Palliser, in the employ of the British government, announced, as a new discovery made in 1858, the existence of a practicable pass. The north-west company, making use of this pass, established a trading post called Kootanae House, on the W. of the Rocky mountains, as early as 1807. Dr. Hector, one of Capt. Palliser's exploring party, deducing the summit level in the Vermilion pass from the rise in Vermilion river, calls it 940 feet; it is in lat. 51° 8' 30", long. 113° 35'. The slope in this pass is only 40 feet to the mile. On either side are the outlying shoulders of the snow-clad mountains. Capt. Palliser crossed at a more elevated portion of the gorge, between the Ranauaskis and the Kootanae rivers, where the summit level is 1,885 feet above Bow river and 2,985 above the sea. W. of this point there is a precipitous slope of 900 feet over loose, angular fragments of rock. Capt. Palliser also met with dense masses of charred timber, which caused considerable obstruction to the horses, and which he supposed to have resulted from lightning. The Saskatchewan river, the largest section of this overland route, is formed by the junction of 2 branches a little W. of long. 105°. According to the latest and least favorable account of it, given by Sir George Simpson, governor of the Hudson's bay company, the N. branch is navigable in stretches by steamboats as high as Edmonton House, lat. 53° 40' N., long. 113° W. He speaks of the existence on this branch of several long rapids, which might be overcome by canals. The grand rapid, 3 m. long, below the fork of the river, at its junction with Lake Winnipeg, is so shallow when the waters are low that the company's boats cannot pass over it. After the waters produced by the melting of the mountain snow come down, from May 10 or 15 to June 1, the navigation of the river becomes good till September, when it is interrupted by the approach of winter. Mr.

Hind traversed a river south of the Saskatchewan a considerable distance, which he thinks can be made of great value for purposes of navigation, and that its valley will become the line of the overland route to the Fraser river gold mines.—The climatology of the region of which

we are treating has long been a subject of dispute, owing to the paucity of published observations. Blodget, in his "Climatology of the United States," has crowded into the following table nearly all the information regarding the mean temperature of this part of the world:

Stations.	Lat.	Long.	Alt., ft.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Edmonton House, Sask'an river	53° 40'	113° 00'	1,800	11.0	14.32										
Carlton House, " "	52° 51'	106° 13'	1,100		5.65										
Cumberland House, " "	53° 57'	102° 20'	900?	-7.0	-4.60	15.20	31.00	51.30	58.8	61.8	59.5	45.8	35.0	17.2	5.6
Norway House, " "	54° 00'	98° 00'	400	-7.0	2.40	7.00	27.10	44.60	54.9	63.5	61.2	46.4	31.1	12.3	1.7
Oxford House, Nelson's river	54° 55'	96° 28'	350?	-22.1	1.90	8.60	28.60	33.00						17.5	13.3
York Factory, Hudson's bay	57° 00'	92° 26'	20	5.1	6.60	4.80	19.20	33.50	47.7	60.0	54.8	41.9	33.4	25.2	3.7
Rupert House, James's bay	51° 21'	75° 40'	20	4.1	0.70	7.60	21.10	41.50						34.8	23.3
Fort Churchill, Hudson's bay	53° 02'	93° 10'	20	21.2	7.30	4.60	16.30	28.40	44.7	56.8	53.4	36.0	26.5	3.8	14.0
Prince of Wales Ft., " "	59° 00'	93° 10'		25.6	17.50	9.20	21.20	38.00	50.0	56.4	53.0	44.0	28.0	1.7	15.5
Fort Hope, Repulse bay	62° 32'	56° 56'	60	29.3	26.70	28.10	3.90	17.90	31.4	41.5	46.3	28.6	12.6	0.7	19.3
Lake Athabasca	58° 43'	111° 48'	700	23.0	4.50	2.40	35.10	44.80	53.9					21.5	9.8
Fort Chippewyan, L. Athabasca	58° 43'	111° 48'	700	8.7	4.00	3.10	19.50	45.40	55.0	63.0	58.1	43.5	33.0	19.1	2.8
Fort Reliance, Slave lake	62° 46'	109° 00'	650	25.0	18.90	6.10	8.20	36.60						20.7	13.4
Fort Resolution, " "	61° 10'	113° 51'	500	0.4	25.60	9.90	12.90	40.10						26.1	12.1
Fort Enterprise, " "	64° 28'	113° 08'	850	15.6	25.90	13.15	5.50	31.20						31.6	21.7
Fort Confidence, Gt. Bear lake	66° 54'	118° 43'	500	21.6	21.50	20.20	4.70							19.4	3.7
Fort Franklin, " "	65° 12'	123° 13'	500	23.3	16.70	5.40	12.40	35.20	48.0	52.1	50.6	41.0	22.5	0.1	10.9
Fort Simpson, Mackenzie river.	61° 51'	121° 57'	400	12.5	9.10	5.50	26.30	48.20	63.6	61.0	53.8	49.1	24.8	8.5	8.4

The depth of snow in these high latitudes, where, from its dryness, an equal quantity will make nearly twice the depth that it would further S., is seldom as great as might be supposed. At Cumberland House, Dec. 15, 1789, the snow was 18 inches deep; from that date it snowed only 4 days during the whole winter, viz.: Jan. 8, Feb. 3, March 6, April 5; at the latter date the greater part of the snow had melted. At Seepaywisk House, in 1792-'3, snow fell Oct. 3, Nov. 1, Dec. 11, Jan. 10, Feb. 8, March 7, and April 1; the depth of snow was greatest on Feb. 8, being $3\frac{1}{2}$ feet. At Buckingham House, in 1793, there was 20 inches of snow on Feb. 6; from the beginning of Dec. 1792, to the close of winter, it snowed only 5 days. At Reindeer lake, in the winter of 1796-'7, it snowed 6 times from Oct. 6 to March 5, when the snow reached its greatest depth, 50 inches; by May 4 it had "packed" down to 3 feet. The greatest depth of snow at Reed Lake House in 1794 occurred in March, and was 30 inches; snow fell on 7 days this winter. At Duck Portage House, in 1795-'6, the greatest depth of snow was 40 inches; after the commencement of December snow fell 6 days during this winter, and the ice in Duck lake, a small body of water, broke up May 5. At the Rocky Mountain House, in 1807, snow fell on 4 different days, from Jan. 16 to April 5. At New Brunswick, about midway between Moose Factory and Lake Superior, the lowest winter temperature in 1814 was 50° below zero. At East Main, on the E. side of James's bay, the lowest winter temperature in 1815 was the same. At Fort Reliance, at the E. extremity of the Great Slave lake, lat. 62° 46' N., the temperature in winter has been known to touch 70° below zero for a few hours; while on the Great Bear lake, which is 4° further N. and about 5° further W., the lowest recorded temperature is -52°; at Fort Franklin, -65.20°; and at the W. extremity of the Great Bear lake, -57°. In summer, at the coldest of these places, the tem-

perature rises to 102° in the sun, and from 48° to 60° in the shade. Under the influence of the summer sun, the snow entirely disappears, leaving the whole country open to the Polar sea. At Nain, Labrador, the mean temperature of 3 years was 23.7° for spring, 48.6° for summer, and 26.5° for the year. In 1768, the mean heat at the mouth of the Churchill river was 78.7°, the least 45° and the greatest 85°. The effect of configuration upon the climate is known to be great. If we are to assume as approximately correct the isothermal line—5° cent., equal to 41° F.—over this portion of the earth's surface, drawn by Kämtz, some extraordinary influences will be required to account for the circumstance that the mean annual temperature at James's bay, lat. 55° N., is no higher than at the mouth of Mackenzie river, some 12° further N. Starting at the same point, other writers on meteorology make the isothermal line intersect Mackenzie river, near its junction with Bear river, and cross about 5° further W. by the time it strikes the parallel of latitude in which the mouth of Mackenzie river is placed. Of the climate of the regions along the lower course of the Mackenzie we must judge mainly by the productions which they are capable of maturing. From lat. 56° N. on Hudson's bay, the boundary line of wood takes a N. W. direction, and before reaching long. 120° rises to lat. 67° N. on the Great Bear lake. Another test may be found in the range of the musk ox; which, commencing a little below Chesterfield inlet, on Hudson's bay, about lat. 52° 30', descends with the increasing elevation of the surface, till, at the S. border of the Great Slave lake, it reaches lat. 51°; whence taking a sweep to the N. W., it touches the Polar sea in long. 141°, the N. E. boundary of Russian America. The N. limit of the moose deer, commencing on Hudson's bay near lat. 61°, sweeps to the N. W., crossing the arctic circle and closing at the Polar sea about 68° 30', a little E. of the mouth of the Mackenzie river. A belt of low evergreens ex-

tends for a considerable width around Hudson's bay. The ice in the bay has a chilling influence upon the surrounding country during nearly the entire year, though to how great an extent this influence is felt seems not to be accurately determined. The buffalo does not find the winter too severe on the upper Athabasca and the Peace river, in the woods of which it obtains the needful shelter. The effect produced by the Rocky mountains, whether in shutting out the influence of the Pacific ocean, or in lowering the temperature of the adjacent region, is undoubtedly very considerable. Some of their peaks are from 12,000 to 15,000 feet high; and their summit, of which the prevailing character is sharp, the plateau form rarely occurring, varies in width at different points. Then there is the E. plateau basin, of which the elevation above the sea in the neighborhood of the mountains is stated by Sir J. Richardson at 8,000 feet. The width of the plateau base of the mountains is less in the British territory than at lat. 42° N. This gives a larger extent of valley and of cultivable land; and according to Blodget there is scarcely any difference in the time at which spring opens along the extensive line of plains from St. Paul to Mackenzie river. At an equal distance from the mountains with the desert regions of the S. lie some of the finest and most productive plains above the frontier line of the United States. In point of production and capacity it has been asserted on good authority that a line S. from Fort Liard, in lat. 60°, is not inferior to a line S. from St. Petersburg. However the fact may be accounted for, the high latitudes are not always subject to a loss of heat corresponding in time or degree to what occurs in the S. parts of the United States. The contrary has sometimes occurred. According to Butler, the oceanic current in the Pacific, which has some resemblance to the Gulf stream in the Atlantic, tends to elevate the isothermal lines on the N. W. coast of America. Beside the ascertained depth of rain at Red river, the fact that of the upper plains the entire surface is covered with grass or wood attests the presence of sufficient moisture. The N. E. portions of this territory are permanently frozen, except some few feet at the surface, which is thawed by the summer's sun. At Lake La Crosse, about lat. 54°, long. 97°, we have the S. limit of perpetual frost; in the far N. the trees are frozen in winter to the heart; the European axe breaks upon them like glass. The range of perpetual frost follows the curve of the isothermals, and rises as we proceed W. much further N., following the line of the mean annual temperature of about 32°. Sir John Richardson says of the isothermal of 32° that in crossing the American continent it ascends to the N. as it goes W.; it comes much lower upon the side of Hudson's bay, and ascends obliquely from Rupert's House, lat. 51°, near the bay, crossing Beaver lake in lat. 55°, and following the valley of the Mississippi to Isle à la Crosse, in lat 56°; but the mean limit may be considered as 55°.

At Fort Simpson, the permanent frost reaches down about 17 feet, but the surface thaws to a depth of 11 feet. At Moose Factory, the perpetual frost extends about 15 feet deep. At York Factory the summer thaw only reaches 3 feet deep. This perpetual frost does not prevent the growth of trees, but merely causes them to spread their roots over the subsoil, which, in summer, is thawed. At Fort Franklin, on Great Bear lake, the snow remains on the ground for 10 months, according to Sir John Richardson. On the Rocky mountains, Col. Lefroy noticed snow in June; he thinks it permanent, as no doubt it is on the higher peaks.—In the 368,000 sq. m. drained by the Saskatchewan, there is much land capable of cultivation; and to the W. some of the cereals may be grown to advantage considerably further N. Barley and garden vegetables can be grown and cattle raised at Fort Simpson, on the Mackenzie, lat. 61° 51'. The northernmost point at which barley has been grown on this continent is at Fort Norman, on the same river, lat. 64° 31'. At Cumberland House, the late frosts render wheat an uncertain crop. Wheat has been raised at Fort Liard, a little below lat. 60°; its cultivation has not been tried at Fort Simpson, and it is not certain that it has at Fort Norman. According to Sir George Simpson, the crops on the Red river and the Saskatchewan are sometimes destroyed by frost, but the failure is exceptional. In 1826, and again in 1847, the Red river overflowed its banks and swept the habitations of the settlers away. In 1818, '19, '20, the locust passed over the colony, literally eating up every green thing. In 1857 it reappeared, but too late to do much mischief.—Red river, where Lord Selkirk planted his colony, is, with its W. branch the Assiniboin, the only part of this vast region where any thing deserving the name of colonization has been attempted. Except at one or two other points, nothing has been done beyond cultivating a few acres around the Hudson's bay company's posts, for the convenience of the traders. The entire colony on the Red river and the Assiniboin does not number 7,000 souls. Some of the Red river settlers, to the number of 120, went to Prairie Portage, 60 m. W. of Fort Garry; 500 more have gone to St. Joseph's, Turtle mountain; and some have gone in other directions. There has of late been hardly any foreign immigration to Red River; while over 100 families have left the colony during the last 10 years. In 1856 the population comprised 316 natives or half-breeds, 116 Scotch, 92 Canadians, 40 English, 13 Irish, 2 Swiss, and 1 Norwegian. As the foreign element is withdrawn, the population declines in civilization. Increased numbers crowd into a house, on account of the inability of families to support themselves separately. The average number of each family, which in 1849 was above 5, had risen in 1856 to above 6. At the former date there were 137, and at the latter 73 more males than females; a change in the relative numbers of the sexes accounted for by

the fact that young men of enterprise had crossed the line with a view of bettering their circumstances in the United States. The settlement is scattered along the river banks, for a distance of about 40 m., upon narrow strips of farms which have a depth of about $\frac{1}{2}$ of a mile. The houses are generally placed on the edge of the table-land close to the channel of the river. At one point, however, the elevation is not sufficient to protect them against floods when the waters rise 30 feet above their ordinary level. On the W. is a boundless prairie. The half-breeds are careless and improvident, while gradual decay marks the cottages of the hunters and trappers. The only good houses are in the occupation of the retired officers of the company, the traders, and the clergy. More than half the colony live by fishing and hunting. Where farming is well conducted, 56 bushels of wheat have been grown to the acre, and 40 on new land is common; potatoes grow to a prodigious size, and Swedish turnips have reached as high as 70 lbs. Indian corn succeeds much better than in Canada; it is usually planted about May 23, and hardly ever fails to ripen. Onions reach extreme dimensions. Melons grow well in the open air. At present the great difficulty in the way of extended cultivation is the want of a market; potatoes sell for 10 cents a bushel when carted 10 m. Spring wheat ripens in about 100 days, and the wheat fly is unknown. Barley sown May 28 was reaped Aug. 18; peas sown May 7 were reaped Sept. 25. Tomatoes, which are peculiarly sensitive to frost, can be grown in the open air in sheltered positions. Every variety of vegetable that grows in Canada flourishes here. The prairies, for hundreds of miles, produce excellent crops of hay. Timber is met with, in narrow strips, on the Red river and the Assiniboin, comprising elm, oak, maple, and poplar. There are trees from 3 to 4 feet in diameter; but there is not a saw mill in the settlement. The want of fuel is severely felt on Red river. The settlement, in 1857, possessed 2,799 horses, 2,726 oxen, 3,883 cattle, 2,644 calves, 4,674 pigs, and 2,429 sheep. There had been a decrease in the number of sheep for the last 8 years; a circumstance ascribed to the absence of any means of manufacturing wool, there being but one carding mill in the settlement, and that not in order. The agricultural implements in use are of English and American manufacture; and produce is hauled in carts into the construction of which not a particle of iron enters. Hay limits on the prairies are established and recognized by the settlers, each having exclusive rights within his own limits.—There is no reason to believe that the country E. of Lake Winnipeg is capable of supporting a considerable population. At York Factory the soil is not adapted to cultivation; it consists principally of mossy swamp. Even turnips are often killed by the summer frosts. But where cultivation is possible, it is the policy of the company not to allow agricultural settlement near their

posts. On the Churchill and Severn rivers vegetables can be raised in favorable years; but the proximity of the ice in the bay renders every kind of crop uncertain. At Moose Factory barley does not ripen with any degree of certainty, and the highest yield of potatoes is sixfold. At Fort Norman, on the Mackenzie, a little below the arctic circle, barley cannot be grown, but potatoes can. At Fort Hope, further N., potatoes have been tried, but without success. At New Brunswick, nearly midway between Moose Factory and Lake Superior, barley has been grown on an excellent soil; wheat is said also to have been raised. At East Main, on the E. side of Hudson's bay, turnips and potatoes are raised upon a sandy soil, exposed to the bleak winds of the sea and Hudson's strait. Cattle kept there by the company, as a resource in case of their ships having to winter in the bay, are fed upon hay taken from the salt marshes around that water. Vetches, strawberries, and currants grow wild. The same vegetable productions are cultivated on Big river, further N. Around Rupert's House, S. of East Main, the soil is better adapted for gardening, and the situation is more sheltered; but the whole extent of cultivation is not equal to one ordinary farm. Moose Factory, the chief depot of the S. department of the company's operations, has a good soil, and is sheltered from the N. winds. Here barley ripens well, and vegetables are abundant; the cultivation of wheat has not been tried. Cattle, horses, sheep, and pigs are kept at this depot. Fort Albany, about 100 m. further N., where the climate is about the same, obtains from the neighboring marshes ready supplies of fodder for cattle. At Henly's and Martin's Falls, Osanaburg, and Lac Seul, potatoes are raised for the company's servants. Wheat is not raised at Norway House, though other descriptions of grain might be. That a productive region of vast extent exists between the Rocky mountains on the W. and Lake Winnipeg, Deer lake, and Wollaston lake on the E., and Athabasca lake and Peace river on the N., there can be no doubt. As a general rule, wherever alluvial spots occur on the Saskatchewan, there is more or less of wood. In the neighborhood of the company's posts, the soil is alluvial and productive. Portions of the prairies are light and sandy, and less capable of bearing heavy grains. Portions of the alluvial flats on the Saskatchewan change their position from time to time by the action of floods; the Indian villages are generally placed upon bluffs 4 or 5 feet above the level to which the floods rise. The region through which the Red river and the Assiniboin run, and between them and Lake Winnipeg, presents a singular and important combination of prairie and wood land. The isolated groves of trees on the rolling prairie look, in many places, like the results of careful culture. Near the W. shores of Lake Winnipeg the limestone often rises near the surface, the immediate shore of the lake being little else than naked rock. It has been said that this rock contains a quan-

tity of magnesia which would be injurious to agriculture. The same authority asserts that below Cumberland House, on the Saskatchewan, there is very little land that could be made productive, sandstone rising near the surface in some places, and others being liable to spring flooding. Between Lake Superior and the prairie country, there is a district less adapted to settlement. Dr. King reports having seen, from Lake La Crosse to Athabasca, a well wooded country, with a black alluvial soil and rank vegetation. Among the kinds of wood he enumerates are birch, beech, and maple, of large and splendid growth; but Col. Crofton declares that, on the E. of the Rocky mountains, it would be impossible to find a tree 5 feet in diameter. While Sir John Richardson thinks the sandy soil of the prairies incapable of producing grain, another writer says experience has proved that 20 crops can be taken from it in succession without manuring. One describes the prairie soil as spongy and extremely retentive of moisture; another says it grows stunted grass, and less of that than of moss; while others expatiate on the luxuriant vegetation with which it is covered. Fur traders could not be expected to desire the advancement of colonization; and accordingly the Hudson's bay company have derided the agricultural capabilities of a territory of which they desired to keep exclusive possession.—The catalogue of quadrupeds in the territory embraces 94 different animals. Those in the pelts of which the company trade are confined to the raccoon, beaver, chinchilla, bear, fisher, 5 kinds of foxes (red, cross, silver, white, and gray), lynx, marten, mink, muskrat, otter, wolf, stone and brown marten, squirrel, fitch, kolinski, ermine, rabbit, wolverene, skunk, and sea otter.—The following is a statement of the distribution of profits to the shareholders of the Hudson's bay company for the years 1847 to 1856, inclusive:

Years.	Dividenda.	Market prices of stock, ex dividend.	
		January.	July.
		£ s. d.	£ s. d.
1847	10 per cent.....		200 00 0
1848	10 "	200 00 0	200 00 0
1849	10 "	200 00 0	200 00 0
1850	20 " of which 10 per cent. was added to stock.....	200 00 0	210 00 0
1851	10 per cent.....	205 00 0	210 00 0
1852	15 " of which 5 per cent. was added to stock.....	205 00 0	215 00 0
1853	£18 4s. 6d. pr. ct., of which £8 4s. 6d. pr. ct. was added to stock..	220 00 0	225 00 0
1854	10 per cent.....	220 00 0	210 00 0
1855	10 "	202 10 0	207 10 0
1856	10 "	195 00 0	200 00 0

The profits of a portion of the stockholders are below what these figures indicate; for of 268 proprietors there were, in July, 1858, 196 who had purchased at 220 to 240 per cent. The profits, however, have been so enormous that it has been deemed advisable to hide the truth by nominal additions to the stock. For the preservation of this monopoly the company relies chiefly upon the political influence of its leading

members. The great argument for the continuance of the monopoly, apart from that drawn from soil and climate, is that the Indians would suffer under a competition of trade; liquor would be supplied to them in destructive quantities, and the whole race would soon disappear. There is probably some truth in this; for the company have taken steps to discourage the use of spirits among the Indians, though it is an exaggeration to represent them as excluding spirituous liquors altogether from the territory. In 1851 the council of the department of Rupert's Land passed an order to discontinue the issuing of spirits at Moose depot, whether to the company's servants, strangers, or Indians; and an agreement was made with the Russian American company prohibiting the use of spirituous liquors on the N. W. coast. In 1850 Mr. Abbott Lawrence, the U. S. minister at London, was instructed to make a friendly remonstrance to the British government against the practice, in which the Hudson's bay company was said to indulge, of distributing large quantities of liquor every year to the Indians on the N. W. frontier of the United States, and asking that instructions might be given to the company to put a stop to the abuse. The colonial secretary, on referring the matter to the company, was met by a denial, which Lord Palmerston communicated to Mr. Lawrence, of the existence of the abuse complained of. The Indian population over which the company has control, E. of the Rocky mountains, is estimated by Sir George Simpson at only 12,730; a figure which, in the opinion of some, is below the truth. There are 25,000 Indians on the plains between the Saskatchewan and the Missouri rivers, over whom the company has no control. Other official statements place the number of thick-wood Indians E. of the Rocky mountains at 35,000, the plain tribes (Blackfeet) at 35,000, and the Esquimaux at 4,000. Sir George Simpson thinks the Indians are decreasing on the plains and increasing in the wooded country; while the Rev. Dr. Anderson, who has also the advantage of a personal knowledge of the country, is of opinion that they are increasing where they are settled, decreasing as nomads; but that, on the whole, they are becoming less numerous. It is difficult to arrive at the real number of a migratory tribe, but the company have the means of knowing how many visit their posts. The whole number is 365,367; but this includes the posts W. as well as E. of the Rocky mountains, and in the former division they are more numerous than in the latter. The post at which the largest number of Indians visit is Edmonton, where 7,500 come to trade; 6,000 to Carlton House; 7,000 to Fort Pitt; 6,000 to the Rocky Mountain House; and 1,500 to Rainy lake. To none of the other posts do more than a few hundreds go, except at Red river settlement and Pembina; at the former of which, including a large part of the entire population of the place, there are 7,000, and at the latter 1,000. There are 7 posts to each of which not more than

50 Indians resort. The small pox has at different times produced terrible havoc among them. The company contribute toward the support of missionaries of different denominations, including an Anglican and a Roman Catholic bishop. The Indians are dependent on the company for fire-arms and ammunition; and the company, holding a monopoly both as buyers and sellers, are able to fix their own prices. In this respect the advocates of open trade and colonization contend that the Indians would benefit by a change. On the other hand, the preservation of the Indian race is declared to be of paramount importance; and as it is assumed that this cannot consist with colonization, it follows that the settlement of those portions of the territory, such as the great valley of the Saskatchewan, which are undoubtedly fit for the purpose, must be prohibited. There are no causes of war between the company and the Indians, and therefore the preservation of peace is not a matter of difficulty. The extent of the Indians' hunting ground is not abridged, and no treaties are forced upon them by which they are obliged to alienate portions of their land. The company have not been fortunate in their attempts, such as they were, to induce the Indians to engage in agriculture. There is a small Indian settlement between Canada and the Red river; and there is or was another at Cedar lake, on the Saskatchewan. The company have made no systematic efforts to collect the Indians into villages, their interest lying in their continuing to follow the chase.—The Red river settlement was founded by Lord Selkirk, a Scottish peer, in 1812. He obtained a grant of 12,000 acres from the Hudson's bay company. The first settlers left Sligo in 1811, and, going by Hudson's bay, wintered at York Factory, proceeding to their destination in the ensuing spring under command of Capt. Macdonald, formerly belonging to a veteran corps in Canada. To this settlement Lord Selkirk gave the name of Osna Boia (Ossian's Town). From the first, the colony was provided with cannon, and in the autumn of 1814 it received a quantity of small arms from the government. The north-west company, who had carried on the fur trade in this quarter before their competitors had extended so far westward, denied the rights claimed by the Hudson's bay company there. The former company, who had for several years extended their trading operations west of the Rocky mountains, where they had 300 *voyageurs*, looked with jealousy upon their rivals. Quarrels arose between the two companies, leading to open hostilities. Each accused the other of being the aggressor. Many of the Red river colonists left for Canada in 1815, under the escort of the north-west company. According to one account, they were enticed away by promises made to them by agents of the north-west company that they would receive grants of land in Canada, and asserted that if they did not leave Red river the Indians would massacre them. The north-west company, on

their part, said they had yielded to the entreaties of the colonists to serve as their escort, and save them from the vengeance of the savages, which, once excited, might effect the extermination of all the white population of the territory. Several of the colonists, before leaving, assisted to carry off the cannon that guarded the place, and placed it in possession of the north-west company, not far distant. The remainder of the colonists were dispersed to the foot of Lake Winnipeg, whence they returned in the autumn of 1815. In the spring of 1816, Lord Selkirk demanded troops, for the protection of his colony, from Sir Gordon Drummond, governor of Lower Canada. The latter refused, and on April 25, 1816, wrote to Lord Selkirk enjoining him to use his influence over the servants and agents of the company to prevent a repetition of those violent proceedings which had been committed on both sides; and informing him that it was the determination of his majesty to punish every one who had been the cause of the excesses which had brought dishonor on the name of Englishmen. A similar communication was addressed to Mr. McGillivray, the head of the north-west company. In 1816, Gov. Semple, who in the previous year had been appointed over the territories of the Hudson's bay company, sent a number of armed men to Qui Appelle river, near one of the trading posts of the rival company, and a collision occurred. While at Fort Douglas, in June, 1816, Gov. Semple gave orders to intercept the progress of some of the north-west company's men, who were passing within about 4 miles of the fort. An engagement took place, in which Gov. Semple was mortally wounded, and most of his men lost their lives. In the course of that summer Lord Selkirk set out with a reinforcement; and after the rival companies had inflicted further injury upon one another, without either of them being entirely vanquished or destroyed, they were amalgamated. From that period the united company reigned supreme from Labrador to the Pacific till the formation of the colony of British Columbia. The infant colony of Red river gathered its scattered forces, and has since maintained a sickly existence, isolated from the rest of the world. The only other attempt to establish a colony within any part of this territory was on the Labrador coast; but it failed from the murderous hostility of the Esquimaux. (See LABRADOR.)—The question of constructing a railway N. of Lakes Huron and Superior, along the great and fertile valley of the Saskatchewan, and across the Rocky mountains at the head of Bow river, to the Pacific ocean, has been mooted. The route is believed to be favorable; but there has been no survey.

HUDSON'S STRAIT, in British North America, a strait connecting Hudson's bay with the ocean and Davis's strait, between lat. 60° and 64° N., long. 65° and 77° W. Its length is about 450 m., its average breadth 100 m., and its least breadth 60 m.

HUÉ, THUA-THIEN, or PHUXUAN, a city of

Asia, capital of the empire of Anam, and of the province of Cochin China, on the river Hué, about 10 m. from its mouth in the China sea; lat. 16° 28' N., long. 107° 12' E.; pop. estimated at from 60,000 to 80,000. It is composed of two cities, an outer and an inner. The former is surrounded by the river, and by walls 5 m. in circumference and 60 feet high, fortified in the European manner. It is entered by 10 bridges and as many corresponding gates, and contains the palaces of the king's near relatives, the different public offices, barracks, prisons, magazines, granaries, and the dwellings and shops of the citizens. In the centre of the outer city is the inner one, which is also walled, and in which are the palaces and seraglio of the king, the palace of his mother, the palace wherein the sovereign receives his mandarins, and guard rooms for the sentinels on duty. Hué is a naval station, and has extensive ship yards, and a large cannon foundry. The streets are traversed by navigable canals. The roadstead of Hué is an excellent and well sheltered harbor. The citadel is fortified after the European fashion, and can hold 40,000 men. The commercial and manufacturing activity of Hué is extensive. In 1787 the city was formally ceded to the French, but has never been occupied by them.

HUESCA, a province of Spain, in Aragon, bounded N. by France, E. by Lerida, S. and S. W. by Saragossa, and W. and N. W. by Navarre; area, 7,526 sq. m.; pop. in 1857, 270,157. The N. part, which is covered by offsets of the Pyrénées, is rugged and mountainous; but the S. is level and fertile. The principal rivers are the Cinca, Essera, Alcanadre, Gallyo, Aragon, and Arva, all tributaries of the Ebro. The climate of the highlands is cold and moist, that of the lowlands mild and healthful. Wine, oil, and cattle are produced. Iron, copper, and lead are found, but there is little mining. The manufactures are linen, woollen, and hempen fabrics, &c.—HUESCA (anc. *Osca*), the capital of the above province, on the Isuela, 35 m. N. E. from Saragossa, pop. about 9,000, is a place of great antiquity. Here Sertorius founded a college for the instruction of Iberian youth in Greek and Roman learning. Julius Cæsar subsequently raised it to the dignity of a *municipium*, and honored it with the title of *Osca Urbis Victrix*. In 1096 Pedro I. of Aragon recovered this city from the Moors, and annexed it to his dominions.

HUET, PIERRE DANIEL, a French scholar, bishop of Avranches, born in Caen, Feb. 8, 1630, died in Paris, Jan. 26, 1721. He studied with distinguished success at Caen and Paris, travelled in Holland and Sweden in 1652, became on his return a member of the newly founded academy of Caen, and in 1662 instituted there another academy of sciences. He was celebrated for various learned works and associated with the principal learned men of France, when in 1670 he was appointed by the king sub-preceptor under Bossuet of the dauphin.

He directed for his royal pupil the preparation of the Delphin edition of the classics (*ad Usum Delphini*). He was received into the French academy in 1674, and was promoted to the see of Avranches in 1689, which he resigned after 10 years, in order to enter an establishment of the Jesuits in Paris, and to devote himself entirely to his studies. He took part in the most important literary, theological, and philosophical discussions of his time. His principal works are: *De Interpretatione* (Paris, 1661); *Lettre sur l'origine des romans* (1670), full of curious researches; *Demonstratio Evangelica* (1679); *Censura Philosophiæ Cartesianæ* (1689), in which he appears as one of the most formidable opponents of Cartesianism, of which he had formerly been an advocate; *Histoire du commerce et de la navigation des anciens* (Lyons, 1716); *Traité philosophique de la faiblesse de l'esprit humain* (Amsterdam, 1723), which, according to Voltaire, was regarded by many as a refutation of his *Demonstratio Evangelica*, and has caused him to be classed among sceptics; and several elegant Greek and Latin poems. D'Olivet published in 1722 a *Huetiana*. He wrote memoirs of his life in Latin (1718; translated into English by Aikin, London, 1726, and into French by Nisard, Paris, 1854).—See Bartholomæus, *Huet, ou le scepticisme théologique* (Paris, 1849), and Gournay, *Huet, sa vie et ses ouvrages* (Paris, 1854).

HUFELAND, CHRISTOPH WILHELM, a German physician, born at Langensalza, Thuringia, Aug. 12, 1762, died in Berlin, Aug. 25, 1836. He was graduated as M.D. in 1783, and was appointed professor of medicine at Jena in 1793. In 1798 he removed to Berlin, and after the establishment of the university of Berlin (1809) he became professor there of special pathology and therapeutics. He was as much distinguished for his humane disposition as for his remarkable skill as a practitioner and comprehensive knowledge of almost all branches of medical science. His work on the art of prolonging life (*Makrobiotik, oder die Kunst das menschliche Leben zu verlängern*, Jena, 1796; 6th ed., Berlin, 1842) was translated into Italian (Venice, 1789), into English (London, 1797; Boston, 1854), and between 1798 and 1824 by 6 different writers into French; also into Servian, Hungarian, Hebrew, and other languages. Among his other great works is one on scrofulous diseases (*Ueber die Natur, Erkenntnissmittel und Heilart der Skrophelkrankheit*, Jena, 1795). His work on the physical training of infants (*Guter Rath an Mütter über die wichtigsten Punkte der physischen Erziehung der Kinder in den ersten Jahren*, Berlin, 1799; 5th ed. 1844) produced many reforms in the system of education; while his *Enchiridion Medicum* (Berlin, 1836; 9th ed. 1851), which gives the experiences of his 50 years of practice, is still consulted with great advantage by the profession. Among his numerous other works peculiar merit must be awarded to his *System der praktischen Heilkunde* (Jena and Leipsic, 1800-'5), and his

Geschichte der Gesundheit (Berlin, 1812; 3d ed. 1816). He founded the polyclinical institute and medico-chirurgical society of Berlin, and the *Journal der praktischen Heilkunde*; introduced the system of mortuary houses (for the prevention of burying alive), the first of which was erected at Weimar under his superintendence; was a zealous advocate of inoculation as a protection against the small pox; and called into existence and endowed charitable institutions for the benefit of poor physicians and of physicians' widows.

HÜGEL, KARL ALEXANDER ANSELM, baron, a German traveller, born in Ratisbon, April 25, 1796. He studied law in Heidelberg, fought as an Austrian officer in 1813-14, was promoted to a captaincy, and held an appointment in the embassy sent to induce Christian, the temporary king of Norway, to resign. In 1821 he went in a diplomatic capacity to Naples, but after returning from Italy lived privately several years in Vienna, devoting himself to natural sciences and gardening. In 1831 he began an extensive course of travel with scientific objects, visiting Greece, Asia Minor, Egypt, Barbary, and very remote portions of India and central Asia. He returned to Europe in 1837, bringing with him a collection of extraordinary value and extent, illustrating ethnography and natural history. The catalogue of his specimens of natural history alone numbered 32,000. Not less remarkable for value were the antique coins, MSS., jewelry, paintings, and silver vessels which he had brought with him. The whole collection was purchased for the imperial museum and library in Vienna. Several German scholars have written descriptions of different portions of Hügel's collection, but the specimens of natural history are not yet exhausted by them. After his return he devoted himself again to gardening, became president of the Austrian horticultural society, and was sent in 1850 as ambassador from Württemberg to Berlin. He wrote: *Botanisches Archiv* (Vienna, 1837); *Kaschmir und das Reich der Sikhs* (Stuttgart, 1840); and *Das Becken von Kabul* (Vienna, 1851-'2).

HUGER, ISAAC, an American revolutionary general, born about 1725, died in South Carolina about 1782. He was one of 5 patriot brothers active in the revolution. His first military service was as a subordinate of Col. Middleton in the expedition against the Cherokees in 1760. Promoted to the rank of brigadier-general in 1777, he took a conspicuous part in the engagements connected with the siege of Savannah in 1778, commanded a force of cavalry at the siege of Charleston in 1780 which was surprised and dispersed by Tarleton, and commanded the Virginia brigade which formed the right wing in the battles of Guilford Court House, March 15, 1781, and Hobkirk's hill, April 25, 1781.—FRANCIS KINLOCK, nephew of the preceding, an American officer, born in 1764, died in Charleston, S. C., Feb. 15, 1855. His father, Major Benjamin Huger, was killed

before the lines of Charleston in 1780. After being a pupil of Dr. John Hunter, and a fellow student of Dr. Physick in Philadelphia, he joined with Dr. Eric Bollman of the latter city in a visit to Europe for the purpose of attempting the rescue of Lafayette from the dungeons of Olmütz, his father having been the first to receive that general on his arrival in Georgetown in 1777. The enterprise resulted in their protracted imprisonment. Huger became a captain in the U. S. army in 1798, was a colonel in the war of 1812, and served in both branches of the legislature of his state.

HUGH CAPET, king of France and the founder of the Capetian dynasty, born about 946, died Oct. 24, 996. When still a child he inherited from his father, Hugh the Great, the duchy of France and the county of Paris, thus taking rank among the most powerful princes of his country. On the death of Louis V., the last of the Carolingian kings, a number of nobles and bishops from all parts of the country being assembled at Senlis, to settle the succession, selected Hugh Capet, in preference to the Carolingian duke Charles of Lorraine, the uncle of the late king. Hugh was consequently crowned at Noyon, July 1, 987, by the archbishop of Rheims. Notwithstanding this election, Charles supported his claims to the crown of France by the sword, and after 4 years' hostilities was apparently on the point of succeeding, when he was treacherously made prisoner by Adalbéron, bishop of Laon, who delivered him to his rival. The unfortunate prince was sent to Orléans, where he soon breathed his last in a dungeon. Hugh, having thus secured possession of the crown, associated his son Robert in the government, which he settled on the principle of hereditary succession. (See CAPETIANS.)

HUGHES, BALL, an English sculptor, born in London, Jan. 19, 1806. He early exhibited a decided taste for modelling, and at 12 years of age made out of wax candle ends a bass-relief copy of a picture representing the wisdom of Solomon, which was afterward cast in silver. The spirited manner in which it was executed decided his father to place him in the studio of Edward Hodges Bailey, where he remained 7 years. While with his instructor he successfully competed for the prizes awarded by the royal academy, winning the large silver medal for the best copy in bass-relief of the Apollo Belvedere; also the silver medal of the society of arts and sciences for a copy of the Barberini faun, the large silver medal for the best original model from life, and a gold medal for an original composition, "Pandora brought by Mercury to Epimetheus." He next made busts of George IV., the dukes of Sussex, York, and Cambridge, beside a statuette of George IV., which was subsequently cast in bronze. During a professional residence with Thomas Coke (afterward earl of Leicester), he became acquainted with some Americans, by whose advice he emigrated in 1829 to New York. His first work of importance was the marble statue of Hamilton,

which was destroyed in the merchants' exchange in New York in the great fire of 1835, and was the first work of its class executed in America. In Trinity church in the same city is his monumental alto-relief, of life size, in memory of Bishop Hobart. In the Boston Athenæum are his casts of "Little Nell" and the group "Uncle Toby and Widow Wadman," neither of which has been carved in marble. A statue of "Oliver Twist" is in the collection of his early patron, the late duke of Devonshire. Among his remaining works are a model for an equestrian statue of Washington, intended for the city of Philadelphia; a "Crucifixion;" the statue of Nathaniel Bowditch, in bronze, in the Mt. Auburn cemetery in Cambridge, Mass.; a spirited statuette of Gen. Warren, and a bust of Washington Irving. Within a few years he has attracted attention by some remarkable sketches done with a hot iron upon wood. Mr. Hughes also appeared for a season as a lecturer upon art. He has for some years resided in Dorchester, near Boston, where he is now engaged upon a statue of "Mary Magdalen."

HUGHES, JOHN, an English essayist and poet, born in Marlborough, Wiltshire, in 1677, died Feb. 17, 1720. He was educated at a dissenting academy in London. At the age of 19 he wrote a tragedy, never printed or played, called "Almasont, Queen of the Goths." His numerous contributions to the literature of the day, in the shape of occasional verses and translations, brought him to the notice of Addison, Pope, Congreve, and other literary men, and Addison requested him to write one act of his "Cato." In 1717 Earl Cowper appointed him to the position of clerk to the commission of the peace. Hughes was the author of a tragedy called "The Siege of Damascus," which was acted for the first time while he lay on his death-bed. He is best known by his papers in the "Spectator," to which he contributed 11 essays and 13 letters. He wrote also a few papers for the "Tatler" and the "Guardian." His works contain several occasional poems, among them "The Court of Neptune," and a "Pindaric Ode on the House of Nassau." He was often employed also to write poetical pieces to be set to music, and among them were English operas on the Italian model. He translated Fontenelle's *Dialogues des morts*, Vertot's *Révolutions du Portugal*, the *Lettres d'Abélard et d'Héloïse*, and Molière's *Misanthrope*, and edited the works of Spenser (1715).

HUGHES, JOHN, D.D., an American Catholic prelate, born in the north of Ireland in 1798. He is the son of a respectable farmer of small means, and emigrated to America in 1817 on account of the disabilities to which his religion was subjected in his native country. His father, who had preceded him to the United States, placed him with a florist to learn the art of gardening; but having little taste for such pursuits, he devoted his spare time to study, and, as soon as his engagement expired, entered the theological seminary of Mount St. Mary's, Emmits-

burg, Md., where he remained for several years, being employed almost from the first as a teacher. He was ordained priest in Philadelphia in 1825, and was settled in a parish in that city. In 1830 he accepted a challenge from the Rev. John Breckinridge, a distinguished Presbyterian clergyman, to discuss the question: "Is the Protestant religion the religion of Christ?" The controversy was carried on in the newspapers for several months, and attracted so much attention that the articles were subsequently collected in a volume, which had for a time a wide circulation. In 1834 Mr. Breckinridge renewed the encounter by proposing an oral discussion on the question: "Is the Roman Catholic religion, in any or in all its principles and doctrines, inimical to civil or religious liberty?" Mr. Hughes immediately came forward as the champion of his creed, and the debate, which was published in book form in 1836, was regarded with great interest by the public of both parties. In 1832 Mr. Hughes founded St. John's church in Philadelphia, and was its rector as long as he remained in that city. In 1837, Bishop Dubois of New York having demanded on account of age and infirmity some relief from the cares of the episcopate, the holy see appointed Mr. Hughes coadjutor. He was consecrated in New York, Jan. 9, 1838, and about two weeks afterward Bishop Dubois was attacked by paralysis, from which he never wholly recovered. In the following year the pope appointed Bishop Hughes administrator of the diocese; and although he did not succeed to the full dignity of bishop until the death of Bishop Dubois in 1842, the government of that portion of the church was thenceforth entirely in his hands. His first measures were directed to a reform in the tenure of church property, which was then vested in lay trustees, a system that had more than once given rise to scandalous conflicts between the congregations and the episcopal authority. All the 8 churches in the city were heavily in debt, and 5 were bankrupt and on the point of being sold. Bishop Hughes resolved to consolidate the church debts, to remove them from the management of laymen, and to secure the titles in his own name. In this undertaking he was violently opposed by the trustees, and was only partially successful, but the most pressing debts were paid off and harmony was eventually restored. In 1839 Bishop Hughes visited France, Austria, and Italy, to obtain pecuniary aid for his diocese. On his return he applied himself with great energy to the cause of Catholic education. Already during the previous year he had purchased property at Fordham, in Westchester co., for the purpose of establishing a college. He now completed its organization, and it was opened in 1841 under the name of St. John's college. The dispute on the school question about this time brought the bishop still more prominently before the public. It was charged by Catholics that the common schools were sectarian in character, and they complained of the injustice of

taxing them for the support of schools to which they could not conscientiously send their children. Public meetings were held, and an association was formed for obtaining relief. It was demanded either that the taxes should be removed, or that a change should be made in the system of education. The Catholics petitioned the common council in Sept. 1840, to designate 7 Catholic schools as "entitled to participate in the common school fund, upon complying with the requirements of the law." Remonstrances to this petition were sent in by the public school society and the pastors of the Methodist Episcopal church, and on Oct. 29 both parties appeared before the common council. The public school society was represented by counsel, Messrs. Theodore Sedgwick and Hiram Ketchum, and on subsequent evenings addresses were made by the Rev. Drs. Bond, Bangs, Reese, Knox, and Spring. Bishop Hughes answered them in an elaborate speech, but the petition was rejected. The Catholics now carried the matter before the legislature. A bill in their favor, having passed the assembly, was lost in the senate, and in the ensuing election the school question assumed a striking prominence in the political canvass. The Catholics, by the advice of the bishop, nominated an independent ticket, and the result of the election showed them to be so strong that some modification of the existing school system was soon effected. Throughout this exciting controversy Bishop Hughes was the animating spirit of his party, and was called on at times to defend himself through the press against the personal attacks of his opponents. In 1841 he established at Fordham the theological seminary of St. Joseph. In Aug. 1842, he held the first diocesan synod of New York, and in a pastoral letter dated Sept. 8 enforced its decrees respecting secret societies and church property. His "Rules for the Administration of Churches without Trustees," published in 1845, embody the system adopted by this synod. About 1843 the extent of his diocese led him to ask for a coadjutor, and the Rev. John McCloskey, now bishop of the diocese of Albany, was accordingly appointed, and was consecrated March 10, 1844. In Dec. 1845, Bishop Hughes sailed again for Europe in order to procure the services of some of the Jesuits, brothers of the Christian schools, and sisters of mercy. He was successful in his efforts, and returned in the spring of 1846. A few months afterward he was solicited by President Polk to accept a special mission to Mexico, but declined. In 1847, at the request of both houses of congress, he delivered a lecture in the hall of representatives at Washington, on "Christianity the only Source of Moral, Social, and Political Regeneration." In this year his diocese was divided by the erection of the sees of Albany and Buffalo, Bishop Hughes retaining all the counties of New York south of the parallel of 42°, with a part of New Jersey. In 1850 New York was raised to the dignity of an archiepiscopal see, and Archbishop Hughes went to

Rome to receive the pallium at the hands of the pope. The first provincial council of New York was held in 1854, and attended by 7 suffragans, the new bishoprics of Brooklyn and Newark having been created the preceding year. Soon after its close the archbishop made another visit to Rome, in order to be present at the definition of the dogma of the immaculate conception. On his return he was involved in a controversy with the Hon. Erastus Brooks, editor of the New York "Express," and member of the state senate, growing out of the church property question. At the petition of the trustees of St. Louis's church, Buffalo, a bill, which subsequently became a law, had been introduced into the legislature designed to vest the titles to all church property in trustees. In supporting this measure Mr. Brooks stated that Archbishop Hughes owned property in the city of New York to the amount of about \$5,000,000. The archbishop at once came forward to attack both Mr. Brooks and the trustees of St. Louis's church, and a long discussion through the newspapers was the result. The archbishop subsequently collected the letters on both sides and published them in a volume, with an introduction reviewing the trustee system (New York, 1855). On Aug. 15, 1858, he laid the corner stone of a new cathedral, designed to be one of the grandest church edifices in America. Beside his controversial works already mentioned, he has published a number of lectures and pamphlets.

HUGI, FRANZ JOSEPH, a Swiss naturalist, born at Grenchen, Soleure, in 1795, chiefly known by his works on glaciers, *Ueber das Wesen der Gletscher* (Stuttgart, 1842) and *Die Gletscher und die erratischen Blöcke* (Soleure, 1843). The result of his annual explorations in the Alps is embodied in his *Naturhistorische Alpenreisen*. In 1835 he explored northern Africa, Sicily, and Italy, and his observations on the phenomena of the sea are contained in his *Grundzüge zu einer allgemeinen Naturansicht*, of which the 1st volume appeared under the title of *Die Erde als Organismus*. He lost his position as professor at the lyceum of Soleure in 1837, on account of his secession from the church of Rome.

HUGO, GUSTAV, a German professor of law and writer on jurisprudence, born in Lörrach, Baden, Nov. 23, 1764, died Sept. 16, 1844. He studied at Göttingen from 1782 to 1785, and first became known to the world by his edition of the "Fragments of Ulpian" (Göttingen, 1788). In 1788 he was appointed professor extraordinary and in 1792 regular professor of law at the university of Göttingen. Previous to his death he became privy councillor. He was one of the first to follow the example of Leibnitz and of Pütter, presenting the Roman law, not according to the succession of chapters, which had long been the established German university method, but classified with reference to the principal eras of its history. He shares with Hanbold and Savigny the reputation of having been one of the principal agents of the progress which

the study of Roman law has made of late years. His principal works are: *Lehrbuch der Geschichte des Römischen Rechts* (Berlin, 1790-1824); *Lehrbuch eines civilistischen Cursus* (1799-1812); *Beiträge zur civilistischen Bücher-Kenntniß* (1829).

HUGO, MARIE VICTOR, a French poet and novelist, born in Besançon, Feb. 26, 1802. The son of an officer whose military duties called him out of France, he was carried in childhood to Elba, Corsica, Switzerland, and Italy. In 1809 he was brought to Paris; and here, for two years, in a quiet and secluded house, which had been a convent of Feuillantines, under the exclusive supervision of his mother and the care of an old priest, he commenced his classical studies in company with an elder brother, Eugène, and a young girl who was afterward to become his wife. His mother, although she had married a republican soldier, was a royalist at heart; and it was in the course of years only that Victor returned gradually to the principles of his father. In 1811, his father having been made a general and appointed major-domo of Joseph Bonaparte, the new king of Spain, Victor went to Madrid, and entered the seminary of nobles with a view of becoming one of the pages of Joseph; but subsequent events defeated this design. In 1812 Mme. Hugo returned to the Feuillantines in Paris with her two sons, and had their classical education continued by the same clergyman who had already instructed them. On the fall of the empire, family difficulties embittered by opposite political feelings brought about a separation between the general and his wife; and thenceforth the young man was placed entirely under the control of the former. He entered a private academy in order to prepare himself for admission to the polytechnic school; here he evinced some taste and ability for mathematics, but much stronger inclination toward poetry. His first attempts in this line, which date as far back as 1815, gave promise of such talent that his father was finally persuaded to allow him to follow literature as his vocation. In 1817 he presented to the French academy a poem upon *Les avantages de l'étude*. He afterward won three prizes in succession at the Toulouse academy of floral games. His first volume of *Odes et ballades* (1822) created a sensation, even after Lamartine's *Méditations*. Two novels, *Han d'Islande* (1823) and *Bug-Jargal* (1825), exhibited him as an original and forcible prose writer. His second volume of *Odes et ballades* appeared in 1826. About this period, in conjunction with MM. Ste. Beuve, Antoine and Émile Deschamps, A. de Vigny, Broussier, the painter, and David the sculptor, he formed a kind of literary association, called the *Cénacle*, in the meetings of which new literary and artistic doctrines were debated. They also established a periodical, called *La muse Française*, which however attracted little attention. Such was not the case with the preface to the drama of *Cromwell*, promulgated in 1827. This play, although unsuitable for the stage, was pre-

sented as a specimen of the literary reforms aimed at by the new school; but it had much less importance than the preface, which was in fact a treatise on æsthetics. Thenceforth Victor Hugo was the acknowledged leader of the romanticists, who waged earnest war against their opponents, the classicists. His claims to this distinction were strengthened in 1828 by the publication of *Les orientales*, a performance unrivalled in point of artistic brilliancy. *Le dernier jour d'un condamné*, which followed, fascinated the public by its vivid delineation of the mental tortures of a man doomed to execution. The contest between the two opposite schools reached its climax when, on Feb. 26, 1830, the drama of *Hernani* was produced at the French theatre. From this period the literary reformers triumphed in every encounter. The year 1831 was perhaps the brightest in the literary life of Hugo, who then won another dramatic triumph with *Marion Delorme*, while his lyrical poems *Les feuilles d'automne* and his novel *Notre Dame de Paris* were received with enthusiasm. His subsequent publications have all been received with great attention. The performance of his dramas, *Lucrèce Borgia* and *Marie Tudor* (1833), *Angelo, tyran de Padoue* (1835), *Ruy Blas* (1838), and especially *Les burgraves* (1843), drew forth marked approbation; his poetical pieces, *Les chants du crépuscule* (1835), *Les voix intérieures* (1837), and *Les rayons et les ombres* (1840), were highly popular; and his miscellaneous writings, *Claude Gueux*, *Étude sur Mirabeau*, *Littérature et philosophie mêlées* (1834), and *Le Rhin* (1842), were scarcely less successful. His literary influence had secured his election to the French academy in 1841, notwithstanding the opposition of the members attached to the old classic school; and having thus reached the highest distinction in literature, he now indulged in political aspirations, which were partly gratified by his being created in 1845 a peer of France by King Louis Philippe. He improved his elevation to advocate liberal measures. On the revolution of Feb. 1848, he was elected a deputy to the constituent assembly, where he generally voted with the conservative party. On his reelection to the legislative assembly, he evinced more democratic and socialistic tendencies. In vehement speeches he denounced the secret policy of President Bonaparte, foretelling the reestablishment of the empire. On the *coup d'état* of Dec. 2, 1851, Hugo was among those deputies who vainly attempted to assert the rights of the assembly and to preserve the constitution. His conduct led to his proscription; he took refuge in the island of Jersey, where, while resuming his literary pursuits, he continued his opposition to Louis Napoleon, publishing in succession his *Napoléon le Petit* (1852), and his bitter satires *Les châtimens* (1853). Two years later he was compelled, on account of some hostile manifestation to the French government, to remove to Guernsey. He refused to accept the amnesty offered to

political exiles in 1859. In 1856 he published, under the title of *Les contemplations*, a collection of lyrical and personal poems which are among his best performances. In Nov. 1859, he published *La légende des siècles* (2 vols. 8vo., Paris), a series of poems mainly of an epical character. He has ready for the press a novel, *Les misérables*, previously announced under the name of *Les misères*. His most important political speeches were published in 1851, in 1 vol. 8vo. There are many editions of his literary works; among them are those in 22 vols. 8vo. (Paris, 1819-'38); the illustrated edition (13 vols., 1840-'41); and the last in 12 vols. 12mo. (1856-'8).—Two sons of the preceding, CHARLES VICTOR, born in 1826, and FRANÇOIS VICTOR, born in 1829, distinguished themselves as pupils of the Charlemagne college, and in 1848, '9, '50 contributed to the newspaper, *L'événement*, which supported the politics of their father. The elder, on account of an article on the death penalty, was sentenced to 6 months' imprisonment. Both accompanied their father in his exile, and have since devoted their leisure hours to literature. Charles has published several light novels, among which *La Bohème dorée* was especially successful. François, after translating with considerable success the sonnets of Shakespeare into French, has undertaken a translation of his dramas; "Hamlet" has already appeared.—One of the two brothers of Victor Hugo, JULES ABEL, born in 1798, died in 1855, deserves mention as a literary man. Among his many publications were: *Histoire de la campagne d'Espagne en 1823* (2 vols. 8vo., Paris, 1824); *France pittoresque, ou description des départements et colonies de la France*, &c. (3 vols. 4to., 1833); *France militaire, histoire des armées Françaises de terre et de mer de 1792 à 1833* (5 vols. 4to., 1834); *France historique et monumentale, histoire générale de la France depuis les temps les plus reculés jusqu'à nos jours, illustrée et expliquée par les monuments de toutes les époques*, &c. (5 vols. 4to., with maps and plans, 1836-'43).

HUGUENOTS, a name of uncertain origin, first applied to all heretics in France, and subsequently to Calvinists. Some derive it from one of the gates of the city of Tours called Hugons, at which these Protestants held their first assemblies; others from the words *Huc nos*, with which their protest commenced; others from *aignos* (Germ. *Eidgenoss*), a confederate. As the term apparently came from the people, it was probably derived, as the *Dictionnaire de Trévoux* suggests, from the hiding in secret places and appearing at night like King Hugon, the great hobgoblin of France. The reformation, which was far from being entirely religious even in Germany, was much more the result of secular and local causes in France. It was consequently but little influenced by Luther, and before Calvin took the lead was almost entirely self-developing. "It was not," says D'Aubigné, "a foreign importation. It was born on French soil; it germinated in Paris; it put forth its shoots in the university itself, that second author-

ity in Romish Christendom." In no country had there been more anti-Catholic influences at work from an early age. Since the days of the troubadours the national tendency to mirth and satire had shown itself in songs and legends levelled at the priesthood, and even in relics of French ecclesiastical art are found vestiges of a freedom unknown to other countries. The existence of secret doctrines and sects remotely oriental in their origin and heretical in their tendency is manifest, not only in this ecclesiastical art, but in many minor political and social rebellions against the church. In time the orientalisms and wild superstitions disappeared, but the opposition to the established order of things and its abuses was vigorously continued, and new sects, or new forms of old ones, arose, which vigorously advocated these innovations. Thus there resulted a constant change from the obscure sects of the middle ages to the Catharists and Waldenses, the result being a constantly increasing spirit of revolt, based on purely moral grounds and on antagonism to political and ecclesiastical abuses, until there arose such bold thinkers as Lefèvre d'Étaples, who has been described as "the link connecting ancient times with modern history, the man in whom the transition is made from the theology of the middle ages to the theology of the reformation." To these influences was added, during the reign of Francis I., the very important aid of courtly fashion, or rather the sympathy of those nobles and scholars who had become interested in the revival of letters, and by whom classic art and literature were cultivated with a zest which was all the keener because such studies were opposed by the orthodox majority of the monks. There was in Germany a powerful secular and merely literary side to the reformation, which attacked the priesthood, first in biting Tannhäuser songs, and later in the *Epistolæ Obscurorum Virorum*. But all these elements of courtly, scholarly, or popular prejudice were far exceeded in spirit and energy in France, where they gave birth not merely to the humor of Rabelais, but to the poetry and philosophy which sprung up around the beautiful Marguerite of Valois, queen of Navarre, from whom the spirit of the reformation was transmitted to Jeanne d'Albret, the mother of Henry IV. At this court all poets, scholars, and clergymen more or less tinged with the spirit of reform, such as Lefèvre, Farel, and Roussel, were welcome; and notwithstanding the severe form which Protestantism soon assumed, it was at one time the true centre of the French reformation. But it was indirectly this worldly and festival character of the first friends of the Protestant cause in France, with their political position, which subsequently reacted on it and prevented it from becoming the state religion. The celebrated concordat agreed upon between Pope Leo X. and Francis I., relative to the nomination and consecration of bishops, &c., was also a cause of this want of success. The parliament of Paris, and with it the univer-

sity and many of the clergy, warmly opposed the concordat as an innovation on the part of Rome; a movement which had the effect of alarming the king lest he should be supposed to sympathize with illegal and unconstitutional agitations. It was therefore easy for the papal nuncio to persuade the king that "a new religion disseminated among a people must result in a change of kings." It was in the city of Meaux, around its bishop Briconnet, that a large body of men inclined to the new faith began, without formally professing schism, to act as reformers. Among these were Gérard Roussel, François Vatable, Martial Mazurier, Jossé Clieithou, Michel d'Arande, and Guillaume Farel. Their labors, joined to the political and social agitations of the day, soon attracted persecution. It is remarkable that this persecution in France acted so effectually on the French reformation as to free it in a great measure from excesses such as those of the Libertines and Anabaptists in Germany. Yet it would probably have fallen away had not the strong hand of Calvin taken it up. Hence we find the French reformers embodying Calvin's ideas of church government and discipline in a common confession of faith, which was formally done at the celebrated general synod in May, 1559. It was during the reign of Henry II. (1547-'59) that the Huguenots gathered such strength as to entertain hopes of becoming the dominant political party; hopes which were confirmed by the fact that several of the royal family, such as the king of Navarre, his brother the prince de Condé, and many of the nobility, including the Châtillons and Admiral Coligni, favored the reformation. From this blending of religious reform with politics arose the conspiracy of Amboise, whose object was to overthrow the power of Duke François of Guise and his brother the cardinal of Lorraine, who with Mary of Scotland ruled the kingdom through the imbecile boy-king Francis II. The king of Navarre and prince de Condé were deeply involved in this plot, and would have suffered death with their Calvinist friends had it not been for the unexpected demise of the king. This caused a pause in persecution, of which the queen mother, Catharine de' Medici, and the ruling party availed themselves for political purposes, becoming more moderate in their treatment of reformers. By extending toleration to the Augsburg Confession, the cardinal of Lorraine shrewdly fomented quarrels between the Calvinists and Lutherans. This state of affairs, which led to terrible commotions, was again temporarily checked by the edict of January, 1562. At this time, during the reigns of two successive kings whose intellectual inferiority rendered a regency always necessary (after 1559), Catharine de' Medici held the reins of authority, while the dukes of Guise supported by the Catholics, and the princes of Bourbon by the Huguenots, contended for the regency. Some liberal concessions, made for policy's sake by Catharine and the Guises to the Huguenots, excited the anger

of the Catholics, and to allay these feelings war was renewed and raged till the peace of St. Germain (1570), when full liberty was guaranteed the Huguenots, and the king's sister given as wife to Henry of Navarre. The leading Protestants were invited to Paris to the nuptials, where on the night of St. Bartholomew, 1572, a general massacre of Protestants was attempted at the instigation of the queen mother. The Huguenots, with Henry of Navarre as leader, now battled against the holy league formed by the Guises and Philip II. Charles IX. died a victim to nervous excitement (1574), and Henry III., disgusted with the tyranny of the league, had Henry, duke of Guise, and the cardinal put to death, and fled for safety to the Protestant camp. He was himself assassinated by the Dominican Clément (1589), and was succeeded by Henry of Navarre, who, to pacify these terrible disorders in France, became a Catholic, but secured full freedom of conscience and all political and religious rights to the Huguenots by the edict of Nantes (1598). The murder of Henry IV. by Ravallac (1610) left the Protestants without a protector. Under his young son and successor Louis XIII. their rights were soon attacked. Cardinal Richelieu, determined to build up royal power and crush all jarring elements, at one time made war upon the Protestants, driving them into an unlucky league with England, which resulted in the siege and capitulation of Rochelle. But his treatment of them was on the whole tolerant, though its ultimate result was to greatly diminish their numbers and weaken their power. From 1629 to 1661, under Richelieu, and especially under his successor Mazarin, there was comparative rest, which the Protestants repaid by exemplary fidelity to the government, resisting the overtures of the great Condé, and actually fighting against him to sustain the throne during the minority of Louis XIV. But this service was badly repaid by Louis, who, after ascending the throne, began at first to employ for the extermination of their creed all manner of means both direct and indirect, including bribery and persecution. Having thus greatly reduced their number, he resolved to take a step which would have the effect of banishing them, and accordingly in 1685 published the celebrated revocation of the edict of Nantes, on which occasion at least 500,000 Protestants took refuge in foreign countries. From this time, for many years, their cause was completely broken in France. At the revolution, however, their civil rights were restored, and of late years their number has been considerably increased, through external as well as internal influences.—So early as 1555, Coligni attempted, but without success, to establish Huguenot colonies in Brazil and Florida. Many departed for North America even before the revocation of the edict of Nantes. Some settled in Ulster co., N. Y., transmitting to us the familiar names of Hasbrouck, Deyo, Dubois, Le-fèvre, Bevier, and Crispell. As early as 1625 several Huguenot families settled in New York.

city, then New Amsterdam. Eminent among these were: Pierre Valette, Thomas Bayeux, Jean Cazals, J. Jacques Moulinars, Jean Barberie, Abraham Jouneau, Etienne de Lancey, D'Hariette, Lafonds, Girard, Pineau, David, Morault, Ebrard, Jay, Gautier, Bonrepaus, Tharze, Barre, Bodin, Ravoux, Richer, Roussel, Beau, and Fresneau. Others founded New Rochelle, near New York, named in honor of the Rochelle where their cause had suffered. Many settled on Staten island, among whom were the Guions, Bedells, and Disosways. Those who fled to Massachusetts were settled in Oxford, Worcester co., but soon removed to Boston. In New York, Massachusetts, and South Carolina the exiles were treated with the greatest kindness, land being given them, and even freedom from taxation granted. Virginia also received a number, among them the Trabues, Guerans, Chambons, Maryes, Chastains, Dupuys, Levilans, Farsis, and others whose names may be found in "Weiss's History of the French Protestant Refugees." Many found a home in Kingston, R. I., among whose names occur those of Carre, Berton, Ayrault, and Godefroy or Godfrey; a few in Pennsylvania; while Maryland received a large number in 1690. But Charleston, S. C., was their favorite resting place, where there were at one time as many as 16,000. Here they added whole streets to the city, and have even at the present day a church following the original ritual. A large proportion of the first names in South Carolina are of Huguenot origin. Among those who were from the beginning of eminent respectability, and of whom most of the descendants still hold an honorable rank, were distinguished the Bayards, Bonneaus, Benois, Bocquets, Bacots, Chevaliers, Cordes, Chastagniers, Duprés, Delistes, Duboses, Dubois, Dutarques, De la Consilières, Dubourdieu, Fayssoux, Gaillards, Gendrons, Horrys, Guignards, Hegers, Legarès, Laurenses, Lansacs, Marions, Mazyecs, Manigaults, Mallichamps, Neuville, Perroneaus, Porchers, Peyres, Rave-nels, Saint Juliens, and Travezants. No class of emigrants has contributed in proportion to their numbers a greater share to the prosperity, intellectual progress, and refinement of the United States than these exiles. They were, almost without exception, persons of superior social standing and good education, yet accustomed by reverses to labor. Their flourishing farms around Mannikin were the wonder of Virginia, and they introduced in all parts of the country important improvements in agriculture and manufactures. In South Carolina they established magnificent plantations on the banks of the Cooper, bringing thither the olive and mulberry. Many of the favorite pears of North America derive their names from them. The Huguenot merchants in South Carolina, among whom the Laurenses, Manigaults, and Mazyecs were distinguished, were soon regarded as the most active and thrifty in the province. Wherever they settled they were noted for severe morality, great charity, and

for politeness and elegance of manners far superior to those of the inhabitants of English origin, but which have had a marked effect on the character of their joint descendants. Of seven presidents who directed the deliberations of the congress of Philadelphia during the revolution, three, Henry Laurens, John Jay, and Elias Boudinot, were of Huguenot parentage.—Among the copious sources existing in reference to Huguenot history, the reader may consult Béza, *Histoire ecclésiastique des églises réformées du royaume de France*; Weiss, *Histoire des réfugiés Protestants de France* (Paris, 1843; translated by H. W. Herbert, New York, 1854); Gieseler, *Lehrbuch der Kirchengeschichte* (Bonn, 1845-'7); Berthold, *Deutschland und die Huguenotten* (Bremen, 1848); P. D. Félice, *Histoire des Protestants de France depuis l'origine de la réformation jusqu'au temps présent* (Paris, 1851); Soldan, *Historisches Taschenbuch* (Leipzig, 1854); the *Bulletin de la société de l'histoire du Protestantisme Français*; and *La France Protestante*, by Eugene and Émile Haag (9 vols., Paris, 1859).

HULIN, or HULLIN, PIERRE AUGUSTIN, count, a French general, born in Paris, Sept. 6, 1758, died Jan. 9, 1841. He enlisted in the army when scarcely 13 years old, entered the regiment of French guards, and was a sergeant when the revolution broke out. He sided with the people, distinguished himself by his valor and humanity at the taking of the Bastille, July 14, 1789, and was rewarded by the appointment of captain in the national guards under Lafayette. During the reign of terror he was incarcerated, but was liberated after the fall of Robespierre. In 1796 he joined the army of Italy under Bonaparte, who appointed him adjutant-general; he held the governorship of Milan in 1797-'8, assisted in the defence of Genoa in 1799, and was in Paris on the 18th Brumaire, when he supported his general. He followed Bonaparte in Italy during the campaign of Marengo; was made brigadier-general and commander of the foot grenadiers in the consular guard in 1803; presided over the court martial which sentenced the duke d'Enghien to death, March 20, 1804; received the rank of general of division and the command of the 1st military division in 1807; and was the next year created count of the empire. He held the command of Paris until the first restoration; and although, after the abdication of Napoleon, he had sent in his adhesion to the new government, he was dismissed by the Bourbons. He resumed his post during the Hundred Days, was arrested on the second restoration, and compelled to leave France, but was allowed to return in 1819. Under the title of *Explications offertes aux hommes impartiaux au sujet de la commission militaire instituée en l'an XII. pour juger le duc d'Enghien* (Paris, 1823), he published a plain account of the part he acted in that tragedy.

HULL, or KINGSTON-UPON-HULL, a municipal and parliamentary borough and seaport of

England, in the E. riding of Yorkshire, on the river Hull, at its mouth in the Humber, 38 m. S. E. from York, 174 m. N. from London, and 20 m. from the sea; pop. in 1851, 84,690. It is built on a low plain, protected against inundation by artificial means, and extends more than 2 m. along the W. bank of the Hull, and nearly the same distance along the N. bank of the Humber. The streets are very irregular, but are mostly well paved, lighted, and drained. The residences of the wealthy inhabitants are principally in the parish of Sculcoates and the new quarter called Myton. A part of the town built along the left bank of the Hull is connected with the remainder by a bridge of 4 arches. On the point of land formed by the junction of the two rivers there is a garrisoned citadel mounting 21 guns which commands the whole harbor. Adjoining it is the new Victoria dock. The old dock, opened in 1778 on the Hull, is 1,703 feet long, 254 feet wide, 9 acres in extent, and capable of accommodating 100 square-rigged ships. The Humber dock was built in 1807-'9, and has an area of 7 acres with accommodation for 70 ships; and the junction dock, constructed in 1827-'9, has an area of 6 acres, can receive 60 ships, and opens into both the Humber dock and the old dock. There is also a new railway dock at the terminus of the Hull and Selby railway. The principal public buildings of the town are the custom house, exchange, post office, mansion house, courts of law, gaol and house of correction, assembly rooms and museum, concert rooms, 2 theatres, several banks, and over 50 churches and chapels. A new corn exchange was opened in 1856. The Holy Trinity church is a handsome cruciform edifice of several dates; the oldest portion was built in 1270. The town has several charitable schools, one of which educates 36 boys to be seamen, and is connected with the Trinity house founded in 1366 for the relief of decayed seamen and the widows of seamen. There is a marine hospital attached to it. Hull college, founded in 1838, occupies a fine Grecian building. There are also a lunatic asylum, a general infirmary, a school of medicine and anatomy, various literary associations with libraries, and botanic and zoological gardens. Among the eminent persons born in Hull was William Wilberforce. The manufactures include canvas, chains, machinery, earthenware, chemicals, leather, sugar, cotton and linen goods, &c. There are ship building yards, rope walks, saw mills, grist mills, bone mills, and oil mills. The principal exports are hardware and manufactures of cotton and woollen; the imports, timber, tar, pitch, rosin, grain, wool, flax, hemp, iron, hides, tallow, horns, bones, &c. The trade is chiefly along the coast, with the Baltic ports, and with Germany, Holland, Belgium, and Denmark. Hull is an important station for steam packets which connect it with various ports of Great Britain and the continent, and also has railway communication with nearly all parts of the kingdom. The registered shipping of the port, Dec. 31, 1856,

consisted of: steam vessels 62, tonnage 14,096; sailing vessels 432, tonnage 50,073; total, vessels 494, tonnage 64,196. In 1856 the entrances of vessels were 4,410, tonnage 811,067; clearances 4,155, tonnage 749,145.

HULL, ISAAC, a commodore in the American navy, born in Derby, Conn., March 9, 1775, died in Philadelphia, Feb. 3, 1843. He commenced his career in the merchant service, and was commissioned as lieutenant in the navy at the commencement of hostilities with France in 1798. In 1800 he was 1st lieutenant of the frigate *Constitution*, and performed a very gallant achievement in cutting out a French letter of marque from under the guns of a strong battery in the harbor of Port Platte, St. Domingo. It was the intention of Commodore Talbot, who commanded the squadron, to go in with the *Constitution*, and capture the letter of marque, after silencing the battery; but as the entrance of the harbor was difficult, he abandoned that idea. A small sloop which had sailed from Port Platte a few days before was detained, and manned at sea from the *Constitution*, with about 90 seamen and marines, under Hull's command, who ran into Port Platte at noonday, boarded and carried the letter of marque, and then landed and spiked the guns of the battery, before the commanding officer could prepare for defence. During the war with Tripoli, 1802-'5, Hull served with distinction in the squadrons of Commodores Preble and Barron, in command of the schooner *Nautilus* and brig *Argus*, participating in the several attacks on the city of Tripoli in July, August, and September, 1804, and subsequently coöperating with Gen. Eaton in the capture of the city of Derne. In May, 1804, he was promoted to the rank of master commandant, and in April, 1806, to that of captain. At the opening of the war of 1812 between the United States and Great Britain, Capt. Hull was in command of the frigate *Constitution*, and in July of that year, while cruising off New York, he fell in with a British squadron consisting of a razee of 64 guns and 4 frigates, which chased the *Constitution* closely for nearly 3 days and nights. The wind was light and baffling, with occasional squalls, nearly the whole time, and at one period of the chase Hull resorted to a novel and successful expedient. The ship being in 26 fathoms water, the boats were lowered, and all the spare rope on board, fit for the purpose, was coiled into them, and bent to a kedge, which was carried out nearly a mile ahead and let go. The ship was warped up to this kedge, which was weighed while another was carried out. In this way she left her pursuers before they discovered the manner in which it was done. The English frigates were several times within gun shot of the *Constitution*, and the seamanlike manner in which she was handled, and advantage taken of every puff and flaw of wind, excited the admiration of the British officers. For 62 hours the officers could only catch a few moments' sleep at long intervals by throwing

themselves on deck, while every man slept at his gun. It should be mentioned that not an anchor was cut away from the Constitution, or a gun lost, or a boat stove, though they were much used in towing and kedging. After this remarkable escape, Hull went into Boston for a few days, whence he sailed Aug. 3, and on Aug. 19, in lat. $41^{\circ} 41' N.$, long. $55^{\circ} 48' W.$, discovered a ship to leeward, which was soon made out to be an English frigate. The course of the Constitution was shaped to close with this vessel, which hove to to await an engagement. At 5 P. M. the English frigate opened her fire at very long range, and at a little after 6 the Constitution closed with her, when both ships bore up and ran off under easy sail, with the wind on the quarter, and a fair action commenced, yard arm to yard arm, at about half pistol shot distance. In 10 minutes the mizzen mast of the English frigate was shot away, and soon after the two ships fell foul of each other; but as the sea was very heavy, and the fire of musketry severe, it was impossible for either party to board. In a few moments the ships separated, and as the Constitution shot ahead, the fore mast of her antagonist fell, carrying with it the main mast, thus reducing her to a wreck. She soon afterward surrendered, and proved to be H. B. M. frigate *Guerriere*, Capt. James A. Dacres, one of the ships which had so recently chased the Constitution. Possession was taken of her soon after 7 P. M., and at daylight the next morning, as she had 4 feet of water in her hold, and was evidently in a sinking condition, the removal of the prisoners was commenced, and completed by 3 P. M. The wreck was now set on fire, and in about 15 minutes she blew up. The Constitution suffered somewhat aloft in this action, though but little in her hull. Her loss was 14 killed and wounded, including Lieut. Bush of the marines among the former, and Lieut., afterward Commodore Morris, and Sailing Master Aylwin, among the latter. The loss of the *Guerriere* in killed and wounded was 79. About two hours elapsed from the commencement of her fire at long range until she struck, though the close action lasted but about 30 minutes. The Constitution was the larger and heavier ship, mounting 54 guns, long 24s and 32-pounder carronades, the *Guerriere* mounting 49 guns, long 18s and 32-pounder carronades. As this was the first naval action of the war, it was regarded as a very important one. Capt. Hull carried his prisoners into Boston, where he was enthusiastically received. Congress at its next session presented a gold medal to him, and silver ones to each commissioned officer under his command in this engagement. After the war his principal services were in command of the navy yards at Boston and Washington, of our squadrons in the Pacific and Mediterranean, and in the board of navy commissioners.

HULL, WILLIAM, an American revolutionary officer, born in Derby, Conn., June 24, 1753, died in Newton, Mass., Nov. 29, 1825. He was graduated at Yale college in 1772 studied law

at Litchfield, Conn., and was admitted to the bar in 1775. He entered the army of the revolution at Cambridge in 1775 as captain of a Connecticut company of volunteers; was promoted to the rank of major in the 8th Massachusetts regiment in 1777, and to that of lieutenant-colonel in 1779, and made inspector of the army under Baron Steuben. He was in the battles at White Plains, Trenton, Princeton, Stillwater, Saratoga, Monmouth, and Stony Point. He commanded the expedition against Morrisania, for which he received the thanks of Washington and of congress. His services throughout the war received the approbation of his superior officers, and neither his courage nor patriotism was ever doubted. After the war he was major-general of the 3d division of Massachusetts militia, and a state senator, and was appointed by Jefferson governor of Michigan territory in 1805. He remained in this office till 1812, when he was appointed as brigadier-general to the command of the north-western army. He marched his troops through the wilderness to Detroit, heard of the declaration of war, and of the fall of Michilimackinac, which let loose the Indians of the north-west upon him, crossed into Canada, but found his communications cut off, recrossed, and on the arrival of Gen. Brock surrendered to that officer the post of Detroit and the territory. For this act he was tried two years after by a court martial, and sentenced to be shot. The execution of the sentence was remitted by the president in consideration of his age and revolutionary services. The time which has passed since these events, and the facts which have been brought to light, have materially modified the opinions of the public concerning this transaction. Historians are now agreed that the difficulties which surrounded Gen. Hull were so great that we need not ascribe his surrender either to treason or to cowardice. In 1824 Gen. Hull published a series of letters in defence of his conduct in this campaign. They had a wide circulation; and shortly after, a public dinner was given to him in Boston. In 1848 a volume was published in New York on his revolutionary services and the campaign of 1812, written by his daughter, Mrs. Maria Campbell of Georgia, and his grandson, the Rev. James F. Clarke of Massachusetts.

HULLAH, JOHN, an English composer and teacher of music, born in Worcester in 1812. His comic opera of the "Village Coquettes," written in conjunction with Dickens, and produced in 1836, first made him known to the public. But after the production of two other operas, he turned his attention about 1838 to the establishment in England of popular singing schools, similar to those which had proved so successful in Paris. Since 1841 it is estimated that more than 10,000 pupils have been under his personal instruction in London, beside many thousands in other parts of the kingdom. By his own exertions and the aid of his friends and pupils was erected in 1847-'53 the spacious singing hall in Long-acre, London, known as

St. Martin's hall, in which 12 concerts are given annually by his pupils.

HUMBER, a river of England, separating the counties of York and Lincoln. It is principally formed by the junction of the Ouse and the Trent. Its course is nearly E. as far as Hull, and S. E. thence to where it falls into the North sea. It is about 40 m. in length, and varies in breadth from 2 to 7 m. The chief towns on its banks are Hull, Goole, and Great Grimsby. By means of its numerous tributaries it drains an area of 10,000 sq. m. It is navigable for the largest ships to Hull, 20 m. from the sea, and throughout for vessels of considerable burden.

HUMBOLDT. I. A N. co. of Iowa, intersected by the Des Moines river, which receives Lizard river near Humboldt, the capital; area, 576 sq. m.; pop. in 1859, 519. It has an undulating surface and a fertile soil. The productions in 1859 were 813 bushels of wheat, 1,721 of oats, 11,542 of Indian corn, 5,791 of potatoes, 1,012 tons of hay, 820 gallons of molasses made from sorghum, and 7,862 lbs. of butter. II. A N. W. co. of Cal., bordering on the Pacific ocean, and drained by Eel river and its branches; area, about 300 sq. m.; pop. in 1858 estimated at 4,020. Humboldt bay lies on the N. W. corner of the county. A large part of the surface is covered with excellent redwood, pine, spruce, and other timber. The productions in 1858 were 40,000 bushels of wheat, 2,250 of Indian corn, 48,000 of oats, 10,000 of barley, 25,000 of peas, 25,000 of potatoes, and 100,000 lbs. of butter. There were 9 saw mills and 4 grist mills. Organized in 1853. Capital, Eureka.

HUMBOLDT, a river of the W. part of Utah, formed by the union of two streams which rise on the W. slope of the Humboldt mountains, a range extending from the Snowy mountains on the N. border of the territory about 250 m. in a S. S. W. direction. The river flows first W. by S., then N. by W., S. W., and for the last 50 m. of its course due S., falling into Lake Humboldt, a fine clear sheet of water about 15 m. long and 40 m. in circumference, in Tooele county. This lake is known as the "sink" of Humboldt river; it has no outlet. The river is 350 m. long, but is in no place larger than a mill stream, and not even a canoe has ever navigated it. Its sources are pure, but it soon becomes impregnated with alkaline matter. Its banks are destitute of timber and almost without shrubs, and are among the barrenest parts of the great basin of Utah. It has no tributary except one small brook. As the only considerable stream flowing E. or W. through the great basin, it is the ordinary emigrant route from the Great Salt lake to California.

HUMBOLDT, FRIEDRICH HEINRICH ALEXANDER von, baron, a German naturalist, the most distinguished savant of the 19th century, born in Berlin, Sept. 14, 1769, died there, May 6, 1859. He was less than 10 years old at the death of his father, who had been adjutant of Duke Ferdinand of Brunswick in the 7 years' war, and afterward a Prussian royal councillor.

He and his elder brother William were educated at home, with special care in the natural sciences, and heard private lectures from Fischer in mathematics, Engel in philosophy, and Dohm in politics. In 1787 he studied at the university of Frankfort-on-the-Oder, returned to Berlin in the following year, and applied himself to the technology of manufactures and to the Greek language. An acquaintance with the young botanist Willdenow led him to gratify his tastes in the study of the cryptogamous plants and of the numerous family of grasses. He passed a year (1789-'90) at the university of Göttingen, studying philology under Heyne, and extending his knowledge of natural history by the instructions of Blumenbach, Beckmann, Lichtenberg, and Link, and by excursions on the Harz mountains and the banks of the Rhine. His first literary attempt, on the art of weaving among the Greeks, was never published. His first published work, the fruit of an excursion from the university, was: *Ueber die Basalte am Rhein, nebst Untersuchungen über Syenit und Basanit der Alten* (Berlin, 1790). A rapid but very instructive journey which he made in 1790, in company with George Forster, through Belgium, Holland, England, and France, gave him a sudden passion for seafaring and a desire, which he constantly cherished, to visit the tropics. He returned to Germany with the purpose of devoting himself to finance as a business, and repaired to a mercantile academy at Hamburg, where he heard lectures on the functions of money, learned bookkeeping, familiarized himself with counting-house affairs, and practised the modern languages with the numerous students from various parts of Europe. He also came into contact with Klopstock, Voss, Claudius, and the two Stolbergs. On a visit to his mother in the following year he obtained permission to change his career and to engage in practical mining; and he went to the mining academy at Freiberg, where for 8 months he enjoyed the private instruction of Werner, and the friendship of Freiesleben, Von Buch, and Del Rio, the last of whom 12 years later he found settled in Mexico. He wrote while there a description of the subterranean flora, and an account of his experiments on the color of plants withdrawn from the light and surrounded by irrespirable gases, entitled *Flora Subterranea Fribergensis, et Aphorismi ex Physiologia Chemica Plantarum*, which first appeared in 1793. With Freiesleben he made the first geognostic description of one of the Bohemian mountain ranges. In 1792 he was appointed by the minister Von Heinitz assessor in the mining department, and accompanied that statesman to the margraviate of Baireuth, where he was promoted to the post of superior mining officer in the Fichtelgebirge, in the Franconian principalities; and he took up his residence in a mountain hamlet near Naila. This office he held 5 years (1792-'7), with numerous interruptions. In 1793-'4 he explored the mining districts in Upper Bavaria, Galicia, and southern Prussia. In 1794

he accompanied the baron von Hardenberg to Frankfort at his solicitation, and was employed in his cabinet correspondence and in missions to the head-quarters of Field Marshal von Mölendorf. On his return he experimented on the nature of fire-damp in mines, and made dangerous researches with a lamp and a respiratory machine constructed on the principle of Beddoes, in spaces artificially filled with irrespirable gases. In 1795 he made a geognostic journey through the Tyrol, Lombardy, and Switzerland, gaining instruction from Volta in Como and Scarpa in Pavia. In 1796 he was sent on a diplomatic mission to the head-quarters of Gen. Moreau in Swabia, and was urged by Gen. Desaix to abandon his intended visit to the tropical regions of the new world in order to attach himself to the already meditated French expedition to Egypt. From the time when he first heard of Galvani's discovery he had accumulated materials for his work *Ueber die gereizte Muskel- und Nervenfasern, nebst Vermuthungen über den chemischen Process des Lebens in der Thier- und Pflanzenwelt* (2 vols., Berlin, 1797-'9). He also familiarized himself with practical astronomy, especially with the use of the sextant for determining geographical positions. On the death of his mother he resolved to prosecute his purpose of a great scientific expedition. Leaving Baireuth in 1797, he passed 3 months at Jena, in intimate relations with Goethe and Schiller, studied anatomy under Loder, and then began a second journey to Italy, with a desire to see the volcanoes Vesuvius, Stromboli, and Etna before his departure from Europe. The revolutionary condition of Italy made his purpose impracticable, and he passed the winter in Salzburg and Berchtesgaden, occupied with meteorological observations. There he accepted the invitation of Lord Bristol to accompany him on an excursion to Upper Egypt, intending also to proceed to Syria and Palestine. He visited Paris to procure the requisite scientific instruments, when, in the month (May, 1798) of Napoleon's departure from Toulon for Alexandria, he heard that Lord Bristol was arrested at Milan charged with having secret political designs in Egypt. Remaining in Paris, he was received with favor by the most distinguished scholars, and became intimate with the future companion of his travels, the young botanist Bonpland. At this time the members of the institute, the professors of the *jardin des plantes*, and the whole learned public were interested in the voyage of circumnavigation which the directory had decreed and put under the command of Capt. Baudin. The expedition was to explore the eastern and western coasts of South America from Buenos Ayres to Panama, to touch at many islands of the South sea, New Zealand, and Madagascar, and to return by the cape of Good Hope. Humboldt received from the directory permission to join the expedition with his instruments, and to leave it when and where he wished. After several months of suspense, the necessities of war obliged the government

to postpone indefinitely the whole undertaking. Thus disappointed in his hopes of travel, he accepted an invitation to accompany the Swedish consul Skjöldebrand, who had been appointed by his court to carry presents to the dey of Algiers, and he intended to proceed by way of Tunis to Egypt. The delay of the Swedish frigate, and the news from Barbary that during the war between the Turks and French every person arriving from a French port was thrown into prison, thwarted this purpose. He, therefore, in company with Bonpland, resolved to spend the winter in Spain; and passing leisurely through Perpignan, Barcelona, Montserrat, and Valencia, making botanical, astronomical, and magnetic observations by the way, they reached Madrid in Feb. 1799. Under the patronage of the first secretary of state, Don Mariano Luis de Urquijo, he was received with distinguished favor at court; and from merely personal confidence, since he was recommended by no other court, all the Spanish possessions in America and the East Indies were opened to him. He received two passports, one from the first secretary of state, the other from the council of the Indies, which permitted him the free use of all instruments for astronomical and geodetic observations, the measurement of mountains, the collection of objects of natural history, and investigations of every kind that might lead to the advancement of science. Such extensive privileges had never before been granted to any traveller. He left Madrid, measuring the elevations on his way through Old Castile, Leon, and Galicia, and on June 5, 1799, embarked with Bonpland in the frigate Pizarro from Corunna. Happily avoiding the English cruisers, they reached Teneriffe on June 19, where they tarried to ascend the peak and to make many observations on the natural features of the island, and arrived at Cumana, in Venezuela, July 16, 1799. After exploring the Venezuelan provinces for 18 months, residing the latter part of the time at Caracas, they set out for the interior from Puerto Cabello over the grassy plains of Calabozo to the river Apure, a branch of the Orinoco. In Indian canoes, consisting of hollow trunks of trees, they made their way to the most southern post of the Spaniards, Fort San Carlos, on the Rio Negro, within two degrees of the equator. They could have advanced only by taking their boats over land, and therefore returned through the Cassiquiare to the Orinoco, which they followed to Angostura, proceeding thence to Cumana. This journey through wild and unfrequented regions was the first which furnished any positive knowledge of the long disputed bifurcation of the Orinoco. They sailed to Havana, but after a few months hastened to seek some southern port, hearing a false report that Baudin, whom they had promised to join, had appeared on the western coast of South America. From Batabano, on the S. of Cuba, they embarked in March, 1801. The season of the year forbade the execution of their

plan of going to Carthagená and Panama, and they sailed for 54 days up the river Magdalena to Honda, in order to reach the high plateau of Bogotá. Thence they made excursions to the most remarkable natural features of the surrounding country. In Sept. 1801, in spite of the rainy season, they began to journey southward, passed Ibaguá, the Cordillera de Quindiu (at an altitude of 11,500 feet, their highest encampment by night), Cartago, Popayan, Almaguer, and the lofty plain of Los Pastos, and reached Quito after experiencing the greatest difficulties for 4 months, Jan. 6, 1802. The next 5 months passed in comprehensive investigations of the elevated vale of Quito, and of the chain of snow-capped volcanoes which surround it. Favored by circumstances, they ascended some of these to heights not before attained. On Chimborazo they reached (June 23, 1802) the unprecedented altitude of 18,096 feet, about 3,276 feet higher than the point reached by La Condamine on the Corazon in 1738, and they were prevented only by a deep crevasse from advancing to the summit. They were joined at Quito by an enthusiastic young French scholar, Carlos Montufar, son of the marquis of Selva Alegre, who attended them throughout their wanderings in Peru and Mexico and back to Paris. Over the pass of the Andes in the paramo of Assuay, by Cuenca and Loja, they descended into the vale of the upper Amazon at Jaén de Bracamoras, and traversing the plateau of Caxamarca, by the mountain city Micupampa (11,140 feet high, near the silver mines of Chota), they reached the western declivity of the Peruvian Andes. From the summit of Guanamarcá (9,000 feet high) they enjoyed for the first time the long-sought view of the Pacific. They reached the coast at Truxillo, and travelled through the sandy deserts of lower Peru to Lima. After one of the principal designs of their Peruvian journey, the observation of the transit of Mercury over the sun, was fulfilled, they embarked from Callao in Dec. 1802, and after a wearisome voyage reached Acapulco in Mexico, March 23, 1803. They arrived in the city of Mexico in April, remained there a few months, and then visited Guanajuato and Valladolid, the province of Michoacán near the Pacific coast, and the volcano of Jorullo, which had first broken out in 1759, and returned by way of Toluca to the capital. They remained in that city, then distinguished for wealth and the culture of its better class of citizens, long enough to arrange their rich collections and to reduce their various observations to order. In Jan. 1804, after having measured the volcano of Toluca and the Cofre de Perote, they descended through the oak forests of Jalapa to Vera Cruz, where they escaped from the prevalent yellow fever. They compared their barometric measurement of the eastern declivity of the highland of Mexico with that which they had formerly completed of the western declivity, and made a profile of the country from sea to sea, the first that was ever given of any entire

country. On March 7, 1804, Humboldt sailed from the coast of Mexico for Havana, where during a two months' residence he completed the materials for his *Essai politique sur l'île de Cuba* (Paris, 1826). He embarked thence with Bonpland and Montufar for Philadelphia, enjoyed a friendly reception at Washington from President Jefferson, and leaving the new world landed at Bordeaux, Aug. 3, 1804, having spent about 5 years in America, and gained a larger store of observations and collections in all departments of natural science, in geography, statistics, and ethnography, than all previous travellers. He selected Paris for his residence, no other city offering so many aids to scientific study or having so many distinguished savants, and remained there till March, 1805, arranging his numerous collections and manuscripts, and experimenting with Gay-Lussac in the laboratory of the polytechnic school on the chemical elements of the atmosphere. He was accompanied by Gay-Lussac, who exerted a lasting influence on his chemical studies, in a visit to Rome and Naples, and also by Von Buch on his return through Switzerland to Berlin, where, after an absence of 9 years, he arrived Nov. 16, 1805. In the hope of modifying the ignominious treaty of Tilsit by negotiation, the government resolved in 1808 to send the young brother of the king, Prince William of Prussia, to the emperor Napoleon at Paris. During the French occupation of Berlin Humboldt had been busy in his garden making hourly observations of the magnetic declination, and he now unexpectedly received the command of the king to accompany Prince William on his difficult mission, and to aid him by his greater knowledge of influential persons and experience of the world. As the condition of Germany made it impracticable to publish there his large scientific works, he was permitted by King Frederic William III., as one of the 8 foreign members of the French academy of sciences, to remain in Paris, which was his residence, excepting brief periods of absence, from 1808 to 1827. There appeared his *Voyage aux régions équinoxiales du nouveau monde* (3 vols. fol., with an atlas, Paris, 1809-'25; translated into German, 6 vols., Stuttgart, 1825-'32). When in 1810 his elder brother resigned the direction of educational affairs in Prussia to become ambassador at Vienna, the former post was urged upon Humboldt by Hardenberg; but he declined it, preferring his independence, especially as the publication of his astronomical, zoological, and botanical works was not yet far advanced. Though the position was one of the highest at the court of Berlin, he chose to remain in the society of the illustrious men who then made Paris the centre of intellectual culture. There he became one of the celebrated *société d'Araucil*. He had also already decided upon a second scientific expedition through upper India, the region of the Himalaya, and Thibet, in preparation for which he was diligently learning the Persian language under Sylvestre de Sacy

and André de Nerciat. He accepted from Count Romanzoff in 1812 an invitation to accompany a Russian expedition over Kashgar and Yarkand to the highlands of Thibet, but the outbreak of war between Russia and France caused the abandonment of the plan. The political events between the peace of Paris and the congress of Aix la Chapelle gave him occasion for several excursions. He went to England in the suite of the king of Prussia in 1814, again in company with Arago when his brother was appointed ambassador to London, and again in 1818 with Valenciennes from Paris to London and from London to Aix la Chapelle, where the king and Hardenberg wished to have him near them during the congress. He also accompanied the king to the congress of Verona and thence to Rome and Naples, and in 1827, at the solicitation of the monarch, gave up his residence in Paris, and returned by way of London and Hamburg to Berlin, where in the following winter he delivered public lectures on the cosmos. In 1829 began a new era in his active career. He undertook, under the patronage of the czar Nicholas, an expedition to northern Asia, the Chinese Soongaria, and the Caspian sea, which was magnificently fitted out by the influence of the minister, Count von Cancrin. The exploration of mines of gold and platinum, the discovery of diamonds outside of the tropics, astronomical and magnetic observations, and geognostic and botanical collections, were the principal results of this undertaking, in which Humboldt was accompanied by Ehrenberg and Gustav Rose. Their course lay through Moscow, Kazan, and the ruins of old Bulghari to Ekaterinburg, the gold mines of the Ural, the platinum mines at Nijni Taghilsk, Bogoslovsk, Verhoturye, and Tobolsk, to Barnaul, Schlangenberg, and Ustkamengorsk in the Altai region, and thence to the Chinese frontier. From the snow-covered Altai mountains the travellers turned toward the southern part of the Ural range, and, attended by a *pulk* of armed Cossacks, traversed the great steppe of Ischim, passed through Petropavlovsk, Omsk, Miask, the salt lake of Ilmen, Zlatoosk, Taganay, Orenburg, Ural'sk (the principal seat of the Uralian Cossacks), Saratov Dubovka, Tzaritzyn, and the beautiful Moravian settlement Sarepta, to Astrakhan and the Caspian sea. They visited the Calmuck chieftain Sered Dshab, and returned by Voronezh, Tula, and Moscow. The entire journey of over 10,000 miles was made in 9 months; its results are given in Rose's *Mineralogisch-geognostische Reise nach dem Ural, Altai und dem Kaspischen Meere* (2 vols., Berlin, 1837-'42), and in Humboldt's *Asie centrale, recherches sur les chaînes de montagnes et la climatologie comparée* (3 vols., Paris, 1843; translated into German by Mahlmann, 2 vols., Berlin, 1843-'4). It extended the knowledge of telluric magnetism, since in consequence of it the Russian imperial academy established a series of magnetic and meteorological stations from St. Petersburg to Peking, an example which was afterward followed by

the British government in the southern hemisphere. The convulsions of 1830 gave a more political direction to Humboldt's activity for several years, without interrupting his scientific career. He had accompanied the crown prince of Prussia in May, 1830, to Warsaw, to the last constitutional diet opened by the emperor Nicholas in person, and he attended the king to the baths of Toplitz. On the news of the French revolution and the accession of Louis Philippe, he was selected, partly on account of his long intimacy with the house of Orleans, to convey to Paris the Prussian recognition of the new monarch, and to send political advices to Berlin. The latter office fell to him again in 1834-'5, and he was called upon to fulfil it 5 times in the following 12 years, residing 4 or 5 months in Paris on each mission. To this period belongs the publication of his *Examen critique de la géographie du nouveau continent* (5 vols., Paris, 1835-'8; translated into German by Ideler, 5 vols., Berlin, 1836 *et seq.*). He made a rapid journey with King Frederic William IV. to England in 1841, to attend the baptism of the prince of Wales, to Denmark in 1845, and resided in Paris several months in 1847-'8, from which time he lived in Prussia, usually in Berlin, pursuing his scientific labors in his advanced age with undiminished zeal and energy.—Humboldt is distinguished, as a man of science, for the comprehensiveness of his researches, and especially for the skill and completeness with which he connected his own observations with all the stores of previous knowledge, and for the clearness with which he expounded facts in their relations. This tendency appeared in one of his earliest works on the contractions of the muscles and nerves, in which, after the progress of physiology for more than half a century, may still be seen the sagacity of his experiments on galvanism, and the truth of most of the inferences which he drew. In his travels he measured elevations, and investigated the nature of the soil and the thermometrical relations, at the same time collecting herbariums, and founding, by a combination of the materials in his hands, the new science of the geography of plants. Linnæus and some of his successors had observed some of the more palpable phenomena of the migrations of plants, without, however, considering elevation or temperature. It remained for Humboldt to bring together the vast series of facts collected from the most remote points, to combine them with his own observations, to show their connection with the laws of physics, and to develop the principles in accordance with which the infinitely numerous forms of the vegetable world have been spread over the earth. He was the first to see that this distribution is connected with the temperature of the air, as well as with the altitudes of the surface on which they grow, and he systematized his researches into a general exposition of the laws by which the distribution of plants is regulated. Connected with this subject he made those extensive investigations into the

mean temperature of a large number of places on the surface of the globe, which led to the drawing of the isothermal lines, so important in their influence in shaping physical geography and giving accuracy to the mode of representing natural phenomena. Before Humboldt we had no graphic representations of complex natural phenomena, which make them easily comprehensible, even to minds of moderate cultivation. It is not too much to say that this mode of representing natural phenomena has rendered it possible to introduce into the more elementary works the broadest generalizations from the investigations of Humboldt in South America. By associating many important questions with botany, he made it one of the most attractive of the natural sciences. He showed the powerful influence exercised by vegetable nature upon the soil, upon the character of a people, and upon the historical development of the human race. This new view of the connection between the physical sciences and human history opened a path which has been followed by a school of subsequent investigators with novel and important results. Though wholly free from mystical meanings and obscure phraseology, his works are marked by poetical conceptions of nature wherever it is his aim to present broad and complete pictures. His delineations of the tropical countries give delight to readers who have no special knowledge or interest in natural history. At the beginning of this century even the coasts of the immense Spanish colonies in America were scarcely known, and but little confidence was placed in the best maps. More than 700 places of which he made astronomical measurements were calculated anew by Oltmann, whose work (2 vols., Paris, 1808-'10) forms the 4th part of Humboldt's "Travels." He himself made the map of the Orinoco and the Magdalena, and the greater part of the atlas of Mexico. It was with the barometer in his hands that he travelled from Bogota to Lima, ascended the peaks of Teneriffe, Chimborazo, and numerous other mountains, and he made 459 measurements of altitude, which were often confirmed by trigonometrical calculations. His measurements in Germany and Siberia, combined with those made by other travellers, furnished valuable results to geography, and were the foundation of theories of the dispersion of plants and animals. Climatology was intimately connected with his researches. By his daily record of the meteorological, thermometrical, and electrical phenomena of the countries through which he passed, he gave a model to Bonssingault, Pentland, and others, and instituted the science of comparative climatology. Originally educated to be a geologist, he early emancipated himself from the prevailing views of the last century, and not only made special observations, but gave comparative views of the geological formation of continents. He was the first to entertain the idea of estimating the average elevation of continents above the sea, previous geographers and geol-

ogists having considered only the altitude of mountain chains and of the lower lands. His principal works in this department are: *Physique générale et géologie* (Paris, 1807); *Essai géognostique sur le gisement des roches dans les deux hémisphères* (Paris and Strasbourg, 1823-'6); and *Fragments de géologie et climatologie Asiatique* (2 vols., Paris, 1831; translated into German by Löwenberg, Berlin, 1832). The phenomena of the volcanoes of South America and Italy he keenly observed and explained. In connection with Bonpland, he made very important observations on the sites, uses, and structure of plants, which he also regarded in their relations to man and from a politico-economical point of view. His principal botanical works are on the geography of plants: *Essai sur la géographie des plantes* (Paris, 1805), and *De Distributione Geographica Plantarum secundum Cæli Temperiem et Altitudinem Montium* (Paris, 1817). The rich herbarium collected by him and Bonpland contained more than 5,000 species of phanerogamous plants, of which 3,500 were new. They were arranged and illustrated by Humboldt, Bonpland, and Kunth, in the following works, which form the 6th part of his "Travels:" *Plantes équinoxiales, recueillies au Mexique et dans l'île de Cuba* (2 vols., Paris, 1809 et seq., with 144 plates); *Monographie des mélastomes et autres genres du même ordre* (2 vols., Paris, 1809-'23, with 120 colored plates); *Nova Genera et Species Plantarum, &c.* (7 vols., Paris, 1815-'25, with 700 plates); *Mimosæ et autres plantes légumineuses du nouveau continent* (Paris, 1819-'24, with 60 plates); *Synopsis Plantarum, &c.* (4 vols., Strasbourg and Paris, 1823-'6); *Révision des graminées* (2 vols., Paris, 1829-'34, with 220 colored plates). The zoological results of his travels are contained in his *Recueil d'observations de zoologie et d'anatomie comparée* (2 vols., Paris, 1805-'32), in the publication of which he was aided by Cuvier, Latreille, and Valenciennes. Another costly work, the *Vues des Cordillères et monuments des peuples indigènes de l'Amérique* (Paris, 1810, with 69 plates), contains elaborate pictures of the scenery of the Andes and of the monuments of the ancient civilization of the aborigines. They were the first examples of landscapes adhering strictly to the truth of natural history. The study of the great architectural works of the ancient Mexicans and Peruvians led Humboldt to investigations of their languages, records, early culture, and migrations. Statistics and ethnography were greatly advanced by him, he being the first foreigner to whom the archives of the colonies were opened. In this department his treatment was peculiar, for his *Essai politique sur le royaume de la Nouvelle Espagne* (2 vols., Paris, 1811) contained statistics united with the facts of natural history, and presented various doctrines of political economy from a new point of view. Especially original and influential were his reflections on the culture of the soil under different climates and on its effects upon civilization, and on the circu-

lation of the precious metals, as if by ebb and flow, when rich mines are anywhere discovered or new relations established between different peoples. Beside his general works, he made many special investigations, as his treatise on the geography of the middle ages, in which he appears at once as historian, astronomer, and savant, his chemical labors with Gay-Lussac, his system of isothermal lines, his experiments on the gymnotus and on the respiration of fishes, and numerous contributions to physical geography. Soon after his return from America he gave a general sketch of the results of his inquiries in his *Ansichten der Natur* (Stuttgart, 1808), in which he aimed to present a picture of the physical world exclusive of every thing that relates to the turmoil of human society and the ambitions of individual men; and in the evening of his life he determined to give a systematic view of the results of his investigation and thought in the whole domain of natural science. This was the design of his "Kosmos" (4 vols., Stuttgart, 1845-'58), which explains the physical universe according to its dependencies and relations, grasps nature as a whole moved and animated by internal forces, and by a comprehensive description shows the unity which prevails amid its variety. It was translated into all the European languages, and has been without an equal in giving an impulse to natural studies. Imitations, explanations, complements, and confutations have since appeared in great numbers. The best works designed to give it a more general and effective character were by Schaller, Cotta, and Bromme. To the personal influence of Humboldt is due nearly all that the Prussian government did for science in the latter part of his life. He obtained the privileges of a citizen for many a young student, was the protector of many unfortunate scholars, and by an irreproachable and generous life obtained the love and esteem of all men of learning, while he enjoyed the favor of princes. The personal habits of Humboldt were very peculiar. He slept but 4 hours, rose at 6 in the winter and 5 in the summer, studied two hours, drank a cup of coffee, and returned to his study to answer letters, of which he received at a low estimation 100,000 annually. From 12 to 2 he received visits, and then returned to study till the dinner hour. From 4 till 11 he passed at the table, generally in company with the king, but sometimes at the meeting of learned societies, or in the company of friends. At 11 he retired to his study, and his best books are said to have been written at midnight. He died after an illness of about two weeks, and in the long procession which followed his funeral car to the tomb were the ministers of state, generals of the army, professors in the university, officers of the court, the diplomatic corps, academicians, students, and citizens; and the coffin was received at the church by the prince regent and the princes of Prussia. "The influence he exerted upon science," says Agassiz, "is incalculable. With him ends a great period in the

history of science, a period to which Cuvier, Laplace, Arago, Gay-Lussac, De Candolle, and Robert Brown belonged."—The life of Humboldt was written by Klencke (2d ed., Leipsic, 1852). His "Travels," "Kosmos," and "Views of Nature" form 9 vols. in Bohn's "Scientific Library." A volume of his "Life, Travels, and Books" was prepared by R. H. Stoddard (New York, 1859).

HUMBOLDT, KARL WILHELM VON, baron, a German scholar and statesman, brother of the preceding, born in Potsdam, June 22, 1767, died at Tegel, April 8, 1835. His early education was conducted by Campe, celebrated for his writings on education, and later by the philosopher Engel, whose instructions appear strongly marked in the literary style formed by Humboldt, and which is shown in his first essay, written at the age of 18, on God, providence, and the immortality of the soul. In 1788 he went to the university of Frankfurt-on-the-Oder, and thence to Göttingen, where he studied philology under the care of Heyne. He here became intimate with George Forster, and through him with Jacobi and Johannes von Müller. When the French revolution broke out, Wilhelm Humboldt, who had long been a reader of Rousseau, went to Paris (July, 1789), in company with Campe; and the result of his observations there was a great distrust of many theories and abstract ideas which he had previously held. Two years later he published his first work on the subject, a memoir in the *Berliner Monatschrift* (1792), entitled *Ideen über Staatserfassung durch die neue Französische Constitution veranlasst*, in which he combated the possibility of establishing a constitution on untried theories. He discussed the subject more fully at a later date in a separate book: *Idées sur un essai de déterminer les limites de l'action que doit exercer l'état*. After completing this work he lost the manuscript, which was not found or published until after his death. In it he combats the theory of subordinating the individual to the state, contending for individual liberty. About this time philology and archæology were becoming prominent objects of investigation, and Humboldt, under the guidance of Heyne and Wolf, entered with enthusiasm upon the study of Greek literature and art. The result appeared in his "Essay on the Greeks" (1792), which was warmly praised by Dahlberg and Schiller, while Wolf himself, 14 years later, admitted, in his *Darstellung der Alterthums-Wissenschaft*, his great obligations to Humboldt. In July, 1791, Humboldt married Caroline Dacheroden, a brilliant woman, who shared with him his Greek studies. In 1793, at Jena, he contracted with Schiller an intimacy which had great influence on his studies, the poet inducing him to apply himself more closely to philosophy and æsthetics. To this intimacy was added that of Goethe, who was then writing "Hermann and Dorothea." This work owed much to the criticisms and care of Humboldt, who not only superintended its printing, but wrote a com-

mentary on it which ranks as a masterpiece of German criticism. In 1797, having lost his father, he began his travels. Goethe and Wolf supplied him with copious notes and programmes of study to be used in Italian travel. Having remained with his family some time at Dresden, visiting Körner, he went to Vienna and thence to Paris, where he arrived in Nov. 1797. After remaining a year and a half in Paris, he went to Spain, where he travelled during 6 months. At this time he was occupied with his system of comparative anthropology, or a philosophical history of mental development, in which every phase of literature should be traced to a corresponding civilization. This he based on philology, and his first studies were directed to the old Spanish languages, and particularly the Basque. He returned to France with a vast amount of material. So earnestly did he pursue these studies that one day, wishing to acquire certain information, he left his family in Paris and departed abruptly for the Basque provinces to obtain it. He returned to Germany in 1801, and was soon after appointed Prussian resident minister in Rome, where he distinguished himself as much in diplomacy as in letters. His knowledge of art enabled him to cultivate friendly personal relations, and his hotel became a point of union for the most intelligent men in Rome. His letters to Goethe and Schiller, his translations of Pindar and Æschylus, and the poems written during this period, indicate great activity and versatility. In 1806 the defeat of Prussia at Jena rendered his political position a most trying one. He remained unwillingly at Rome during 1807, being desirous of contributing his aid to his country while recovering from its disasters. In 1808 he was recalled by family affairs, and was immediately appointed minister of state for the departments of religion, public education, and medical establishments. He was called under very trying circumstances, in Jan. 1809, to reorganize public instruction in Prussia; and the prominent position which that country at present holds in education is in a great measure due to him. He also aided in founding the university of Berlin in 1810. All his reforms were effected during a period of general confusion, and in the face of opposition which demanded great firmness, and often severity. When they were fairly established, he reentered the diplomatic service, and on June 14, 1810, was appointed minister at the court of Vienna. At Prague he met with the minister Stein, who was then flying from the pursuit of Napoleon, and with him concerted the part he was to take in the political struggles of the day. Stein had been greatly interested in the energetic reforms of Humboldt, and now gave him his full confidence. His task at the court of Austria was to effect the reconciliation of Prussia and Austria, to consolidate the strength of Germany, and to excite it against Napoleon. The difficulty of the effort was greatly increased during the residence of Humboldt at Vienna by the passive

position assumed by Austria after the campaign of 1809, and the marriage of Maria Louisa to Napoleon in 1810. Finally in 1813, when Prussia rose against Napoleon, the conference of Prague was held. At this most critical period the perseverance of Humboldt succeeded in overcoming the doubts of Metternich. After the treaty of Aug. 10, 1813, which united the powers of Europe against Napoleon, and which was decided by Austria, Stein wrote a letter to the count of Münster declaring that the course taken by Austria was entirely due to Humboldt. Talleyrand said of him that there were not in Europe three men of his ability. He manifested the same shrewdness, reserve, and energy at the conferences of 1813-'14 at Frankfurt, Châtillon, Paris, and the congress of Vienna. During his diplomatic career he showed great genius in debate, quickness of reply, and a most delicate, cutting irony. In 1816 he went to Frankfurt as minister, and in 1818 to London and Aix la Chapelle. In 1819 he was called to the ministry, and charged with settling the territorial difficulties of Aix la Chapelle. At this time the king of Prussia determined not to introduce the representative system promised to the people. Other points of difficulty arose, and Humboldt disagreed with his colleagues. By a decree of Dec. 31, 1819, he was dismissed from the ministry and deprived of his state appointments. He now retired to private life, and devoted himself to literature. His contributions to philology from this time were very extensive, and of such importance that it has been said that before him great minds, such as Herder, Adelung, and Friedrich Schlegel, had led the way, but Humboldt was the first who made of philology a science. Having formed the intention to follow all the languages of the Pacific in detail in order to establish the connection between India and Europe, he began with his work *Ueber die Kawi-Sprache auf der Insel Java* (Berlin, 1836), in which he traces the languages, history, and literature of the Malay races. His principal works are a number of criticisms collected in the *Ästhetische Versuche* (Brunswick, 1799); a translation of the *Agamemnon* of Æschylus, a work containing also valuable researches into the Greek language and metres; the *Berichtigungen und Zusätze zu Adelung's Mithridates* (Berlin, 1817); *Prüfung der Untersuchungen über die Ueberroher Spaniens*, &c. (1821); *Bhagavadghita* (1826); and *Ueber den Dualis* (1828). His collected works were published by his brother Alexander (4 vols. 8vo., 1841). His collection of MSS. and books he bequeathed to the royal library of Berlin.

HUME, DAVID, a Scottish metaphysician and historian, born in Edinburgh, April 26, 1711, died Aug. 25, 1776. His father, Joseph Hume, was proprietor of the estate of Ninewells in Berwickshire, which had long been in the family. He died during the infancy of the historian, leaving three children, who were brought up by their mother with great strictness, tenderness, and frugality. Hume, having early

shown a fondness for study, was intended for the bar. He passed through the university of Edinburgh, but was drawn away from his legal studies by that love for literature which became the ruling passion of his life and the great source of his enjoyments. At 16 he began to govern his conduct by the principles of philosophy, and prepared himself to meet with composure the strokes of fortune. He was already, too, a sceptic in matters of religion. His inheritance as a younger son being small, in 1734 he entered a counting room at Bristol, whence after a few months he passed over into France, and lived for three years with great economy while composing his "Treatise of Human Nature." In 1738 he printed his work in London. It was noticed with some favor by a literary periodical of the day, but Hume, in his "Own Life," states that it "fell dead born from the press." Returning to live at Ninewells, he printed anonymously at Edinburgh, in 1742, the first volume of his "Essays," which was well received. He next sought a professorship in the Edinburgh university, but his sceptical principles prevented his success. In 1745 he went to live as companion to the marquis of Annandale, on a yearly salary of £300; but the marquis was insane, and Hume soon found his position in the family exceedingly painful. He remained here a year. In 1746 Gen. St. Clair invited him to become his private secretary, in an expedition designed for the invasion of Canada, but which was finally directed against the coast of France. Hume was also made judge advocate in the army, and was highly popular with his military associates. When St. Clair went as minister to Turin, he took Hume with him as his secretary. On his way to Italy he passed through Germany, sailed down the Danube, and at Vienna was presented to the empress Maria Theresa. Lord Charlemont, who met the philosopher in the court circles of Turin, describes him as tall, ungainly, and fat, with an unmeaning face, heavy features, and spiritless eyes; he wore awkwardly a military dress, and spoke with a broad Scotch accent; but his good humor, simplicity, and real benevolence won general regard. While at Turin, his "Inquiry concerning the Human Understanding," a new casting of the unfortunate "Treatise," was printed at London with indifferent success. On his return from Italy in 1749, he lived with his brother and sister at Ninewells, his mother being now dead, and there wrote his "Political Discourses" and the "Inquiry concerning the Principles of Morals." These were printed in 1752, and the "Discourses" were generally admired. His brother having married, Hume and his sister commenced housekeeping on a frugal scale at Edinburgh, and he now boasted to his friends, with philosophic good humor, that he was worth £1,000, and wanted nothing. In 1752, after strong opposition, he was chosen librarian of the advocates' library of Edinburgh, and now began his "History of England." He wrote rapidly, and without laborious research.

The first volume of the "History of the House of Stuart," containing the reigns of James I. and Charles I., came out toward the end of 1754 amid general disapprobation, and the author relates that in his disappointment he thought of changing his name and hiding in some obscure retreat in France. His tory leanings and his open scepticism displeased the ruling political and religious parties of the day. The history, however, had a sale in Edinburgh, but in London only 45 copies were taken in a year. Dr. Herring, primate of England, and Dr. Stone, primate of Ireland, sent word to the author not to be discouraged. In 1756 he published a second volume, embracing the reigns of Charles II. and James II., which was better received. Hume had now formed a wide acquaintance among the professional and literary men of Scotland, his amiable manners and pure morals having conquered the prejudices excited by his sceptical opinions. The general assembly of 1755, however, condemned his writings, and even threatened him with excommunication; but the moderate party, led by Dr. Robertson, turned aside the blow. In 1757 appeared his "Natural History of Religion," which Dr. Hurd attacked in a violent pamphlet. Hume meanwhile became the patron of the rising literature of Scotland. He aided the blind poet Blacklock, and encouraged Wilkie, author of the "Epigoniad." He had no literary jealousy, and labored with ardor to advance the fame of Robertson, Adam Smith, and almost every Scottish author of his time. Toward the end of 1758 he went to London to publish the "History of the House of Tudor." It appeared in 1759, and was severely criticized, while Robertson's "History of Scotland" was everywhere praised. In 1761 Hume published two volumes containing the earlier portion of the English annals. He proposed to write two more volumes to embrace the reigns of William III. and Anne, but this design was not fulfilled. By the sale of his copyrights, for which he received large prices, he had now gathered a moderate fortune, and lived in James court, Edinburgh, in philosophic ease. But in 1763 the marquis of Hertford invited him to accompany him to Paris, where the marquis was appointed minister; he promised Hume that he should be made secretary to the embassy. Hume at first declined the invitation, fearing to lose happiness in ambition, but finally attended the marquis, and was received at Paris with signal distinction. The whole royal family, the French philosophers, the nobility, and particularly the ladies of high rank and fashion, overwhelmed him with their attentions, and Hume wrote to his friends in Scotland that Louis XIV. had never suffered so much flattery in three weeks as he had done. In the midst of his triumph, however, he still retained his moderation, simplicity, and composure. When Lord Hertford left Paris, he became chargé d'affaires, and conducted several diplomatic measures with prudence and skill. In the beginning of 1766 he returned to

England, bringing with him Rousseau, who sought there a refuge from persecution. Hume provided Rousseau with retired lodgings in Derbyshire, and obtained for him a pension from the king. But this singular person soon afterward wrote a letter to Hume, accusing him of desiring to destroy his fame. Their quarrel made a great sensation, and Hume in self-defence published the letters that had passed between them. In 1766 Hume went to Edinburgh, but was invited by Gen. Conway the next year to become under secretary of state. He remained in London until Conway was superseded, and in 1769 returned to Edinburgh. He was now rich, being worth £1,000 a year, and employed himself in building a house, and in the pleasures of society. By March 23, 1775, his health began to decline. The next spring he wrote a congratulatory letter to Gibbon, who had sent him the first volume of the "Decline and Fall." In April, 1776, he finished his "Own Life," a concise narrative of his literary career. After a journey to Bath, in company with John Home, he returned to Edinburgh to die. Five days before his death he wrote to the countess de Boufflers: "I see death gradually approach without any anxiety or regret. I salute you with great affection and regard for the last time." He died cheerfully and easily, without apparent pain, and was buried in Calton hill grave yard, Edinburgh, where a monument to him was erected. Hume's character was singularly pure and beneficent. He was charitable when he had little to spare, his temper was mild and even, and his friends spoke of him as wise and good above other men. His enemies have accused him of insincerity, and of inculcating principles dangerous to human happiness. As a historian he is generally allowed to hold the first rank among English writers. His narrative is interesting, his style almost faultless, and with happy ease he blends profound thought, distinct portraiture, and skilful appeals to the feelings. He wants, however, accuracy and impartiality. His "Essays" are clear, thoughtful, and novel, but show little imagination or inventive power. He founds his ethical system upon utility, and would determine the moral value of actions by their consequences. His metaphysical speculations cannot be said to form a complete or a well ordered system. He asserts that the mind is conscious only of impressions and ideas, and that the impression always precedes the idea; there are therefore no cognitions but those derived from external sources. He adopts the representative theory, and infers that there is no clearer proof of the existence of mind than there is of matter. Belief is only a vivid idea. He traces the course of thought to the law of association, which he founds upon three principles, resemblance, contiguity, and cause and effect. But the doctrine of cause and effect is only a habit of the mind, resulting from experience. There is no proof that similar causes will always produce similar effects. Thus all is uncertain-

ty, and the mind is reduced to general scepticism. To these theories the Scottish philosophers, led by Reid, opposed the doctrine of common sense, accepting as true whatever is generally believed. Kant and his German followers, excited by Hume's doubts, invented on the other hand the theory that the mind creates, by its own action, a certain number of cognitions, which they have attempted to define. Sir William Hamilton again, destroying the theory of representation, asserts that of immediate perception. Each of these schools of metaphysics therefore had its origin in the scepticism of Hume. But whatever may be thought of the effect of his writings, it must be allowed that Hume's intellect presents a rare example of the union of high philosophical power with great refinement, and a clear and almost faultless mode of expression.—Hume's history was continued by Smollett from the revolution to the death of George II., and an addition has since been made, bringing it down to the year 1835, by the Rev. T. S. Hughes. One of the latest editions is in 18 vols. 12mo. (London, 1856). The best editions of his philosophical works are those of Edinburgh, 4 vols. 8vo., 1836, and of Boston, U. S., 4 vols. 8vo., 1854. The latter is the more complete. See the "Life and Correspondence of David Hume," edited by John Hill Burton (2 vols. 8vo., Edinburgh, 1847).

HUME, JAMES DEACON, an English civilian, born in Newington, Surrey, April 28, 1774, died in Reigate, Jan. 12, 1842. He was educated at Westminster school, and at the age of 16 received a clerkship in the custom house. He married in 1798, and a few years later removed to Pinner, near Harrow, where he engaged in agricultural pursuits, at the same time fulfilling his official duties in London. He relinquished his farming occupations in 1822. A report written by him for the use of the commissioners of the custom house introduced him to the friendship of Mr. Huskisson. With the sanction of the lords of the treasury he began in 1823 the task of consolidating the laws of the customs, which had accumulated from the reign of Edward I. to the number of 1,500 often confused and contradictory statutes. After nearly 3 years of labor by night and day, he produced his compilation and revision, which received the royal assent in 1825, and was pronounced by Mr. Huskisson "the perfection of codification." In 11 intelligible statutes he contrived to preserve all that was requisite. The government immediately voted him £6,000 as an acknowledgment of his services. He soon became connected with the board of trade, where he was so much in request at the consultations that in 1828 the office of joint secretary was created for him. At the same time he resigned the office of controller of the customs, which he had held for 38 years. "The history of the board of trade," says Sir James Graham, "from the time of Mr. Huskisson to the close of Mr. Deacon Hume's services at that board, may be considered as the history of Mr. Deacon

Hume himself; for he was the life and soul of that department, and every good measure which was adopted in rapid succession at that period either received his earnest support, or may be traced to his wise suggestion." It was through him that the forgeries of Fauntleroy were discovered in 1824. In 1840, in consequence of the strain of his long and severe labors upon his health, he retired from the board of trade, received an annual pension from the government of £1,500, and fixed his residence at Reigate. He was, however, often consulted by Sir Robert Peel, and his evidence before the import duties committee in 1840 had great weight with the leading men of all parties. Beside his numerous and important official papers, he wrote occasionally for periodicals on politico-economical subjects. A memoir of his life has been written by Charles Badham (London, 1859).

HUME, JOSEPH, a British statesman and reformer, born in Montrose, Scotland, in Jan. 1777, died in Burnley hall, Norfolk, Feb. 20, 1855. At about the age of 9 he lost his father, the master of a small fishing or trading vessel, but was enabled by the thrift and industry of his mother, who established a retail crockery shop in Montrose for the support of her children, to receive a tolerable education in the schools of his native town. About 1790 he was placed with a surgeon apothecary of Montrose, and 3 years later he became a student of medicine at the university of Edinburgh, where he remained until 1796, when he was admitted a member of the college of surgeons of Edinburgh. Being appointed as surgeon to an East Indianman, he made two voyages to India in the company's vessels, and in 1799 joined the medical establishment in Bengal. In his second voyage out he had given evidence of his energy and capacity by acting temporarily as purser upon the death of that functionary; and upon his arrival in India his temperate habits, his regularity in the discharge of his duties, and his excellent judgment, combined to recommend him for advancement. Finding that few of the company's servants had taken the trouble to acquire the native languages, he at once applied himself to the study of them, and was soon able to speak them with fluency—a circumstance which undoubtedly laid the foundation of his fortune. At the outbreak of the Mahratta war in 1802 he was attached to the division of the army under Gen. Powell, and upon a sudden emergency officiated as Persian interpreter with so much efficiency, that he was appointed to discharge the duties of that office permanently. At the same time he was at the head of the medical staff, and for long periods acted as paymaster, postmaster, prize agent, and commissary-general. These multifarious employments brought him not merely reputation but handsome and fairly earned emoluments; and in 1808 he was able to retire from professional life, and return to England with a fortune of between £30,000 and £40,000. For several years he devoted himself to travel and study, visiting every place of importance, and particu-

larly the manufacturing towns, in the United Kingdom, and in 1810–'11 making an extended tour throughout southern Europe and Egypt. Too energetic to pursue the career of a man of leisure, he immediately set about the acquisition of seats in parliament and in the East India board, with a view of devoting the remainder of his life to public business. In Jan. 1812, he was for a valuable consideration returned to the house of commons as one of the members for Weymouth and Melcombe Regis, commencing his political career as a tory. Before the parliament was dissolved, however, in the succeeding July, he gave evidence of his independent character by opposing a ministerial measure for the relief of the Nottingham frame-work knitters, on the ground that the masters would be thereby so much injured that the workmen would be reduced to a worse state than before. The reputation for independence and determination which Mr. Hume acquired during the first 6 months of his legislative career alarmed the conservative patrons of Weymouth and Melcombe Regis, and at the succeeding election they refused him a seat, notwithstanding he had bargained for a second return. This proceeding probably opened the eyes of the new member to the evils of the borough system, for, although offered seats from other boroughs, he refused to enter parliament again except as a perfectly free member, a contingency which did not occur for several years. During this interval he busied himself with a variety of projects for the moral, intellectual, and physical improvement of the laboring classes, for whose benefit he also advocated the establishment of savings banks. His chief efforts, however, were directed against the abuses perpetrated by the East India direction, for a seat in which he was an indefatigable though invariably an unsuccessful candidate. In Jan. 1819, he reentered parliament as a radical member for the Aberdeen district of burghs, comprehending his native town, Montrose; and during the first session on several occasions he recorded his views in favor of the repeal of the usury laws, of the corn laws, and of other restrictions upon commerce and manufactures. He continued to represent the Scotch burghs until 1830, when he was returned unopposed as one of the members for Middlesex. In 1837 he was defeated by a small majority, but was immediately returned through the interest of Mr. O'Connell for Kilkenny, which he represented until 1841, when in the great conservative reaction of that year he was an unsuccessful candidate for the town of Leeds. In the succeeding year he offered himself once more to the electors of Montrose, in whose service he died. In variety and importance his legislative labors were not surpassed, if indeed they were equalled, by the most eminent of his contemporaries. His speeches alone would fill many volumes of "Hansard's Debates," and his motions, returns, reports, and other acts in the house of commons, independent of his vigorous agitation of public measures outside of its doors, were almost in-

numerable. Possessing an unusual degree of patience, courage, and tenacity of purpose, he proposed and advocated sweeping reforms in all departments of government, civil, military, and ecclesiastical, with a perseverance which repeated defeats and the coarsest ridicule could never overcome. He early advocated the abolition of military flogging, naval impressment, and imprisonment for debt, and, almost unaided, effected the repeal of the acts prohibiting the export of machinery and the emigration of workmen. His efforts against colonial abuses, election expenses, the licensing system, and duties on paper, tea, tobacco, &c., were not the less strenuous because futile; while those against Orange lodges and close vestries were completely successful. It is scarcely necessary to add that Catholic emancipation, the repeal of the test and corporation acts, and the reform act of 1832 found in him an energetic supporter. As a keen unraveller of accounts he had no superior, and for the manner in which in 1821 he procured from the ministry a pledge that the ordinance estimates should be submitted to the house in detail, he was publicly complimented by Sir James Mackintosh and other members of the opposition. Commencing his career as a reformer almost single-handed, he was soon at the head of a real minority which was subsequently developed into an undoubted majority, and which gave the key note to various species of reform. In the face of neglect, contempt, and almost open insult, he worked his way up to a first-rate position as a legislator, and lived to see nearly every important measure which he had advocated, and which at the outset had been met by insolent opposition, ultimately adopted. Although several times invited to take office, he invariably declined, preferring his independent position; and notwithstanding that in the discharge of his public duties he frequently expended large sums from his private purse, "he passed the whole of a long life," to adopt the words of one of his contemporaries, "in serving the people without fee or reward." His private character was without a stain, and his gentleness and consideration for others extorted the admiration even of his opponents, among others of the late Sir Robert Peel, who also publicly eulogized his integrity, and the valuable character of his long services. His capacity for labor was almost proverbial, and probably no man of his time attended parliamentary sessions so regularly or sat upon such a variety of committees. As a speaker he never rose to eloquence, and even in the most heated debates so completely preserved his equanimity that it was said of him by Lord Palmerston, in noticing his decease, that "any feeling excited by his party conflicts never went even to the door of the house." A statue of him was in 1859 erected in his native place, to commemorate his efforts in behalf of the people.

HUMMEL, JOHANN NEPOMUK, a German composer, born in Presburg, Nov. 14, 1778, died in Weimar, Oct. 17, 1837. At 7 years

of age he exhibited such remarkable precocity that Mozart, contrary to his custom, offered to direct his musical education. At the age of 9 he could play so skilfully on the piano that his father was induced to exhibit his talents in concerts. He excited universal admiration throughout Germany and subsequently in England, and returned home, after an absence of 6 years, the most brilliant pianist of the German school. He gave his attention for several years to the study of harmony, accompaniment, and counterpoint, and soon rendered his name famous in Germany by his operas and masses, and particularly by his instrumental compositions. He retained his supremacy as a pianist until the close of his life.

HUMMING BIRD, the common name of a large family (*trochilidae*) of slender-billed birds, found in America and its adjacent islands. There are 3 sub-families, *grypinae* or wedge-tailed humming birds, *lamporninae* or curved-billed humming birds, and *trochilinae* or straight-billed humming birds. These delicate and beautiful creatures, peculiar to America as the sun birds are to the old world, have always attracted attention even from the aboriginal inhabitants of this continent; the ancient Mexicans worked their feathers into mantles, pictures, and various ornamental articles. No epithet has been spared to convey an idea of the richness of coloring of these birds, and yet all fail in comparison with the reality; "the lustres of the topaz, emeralds, and rubies," "the hue of roses steeped in liquid fire," "the locks of the star of day," the "beams of the sun," and similar expressions, fall far short of the changing tints of their "gorgeous plumery." The most brilliant species live in the tropical forests, amid the rich drapery of the orchids, whose magnificent blossoms rival the beauty of the birds themselves. As we leave the tropics their numbers decrease, and but a few species are found within the limits of the United States, some however reaching as high as lat. 57° N. In whatever latitude, their manners are the same; very quick and active, almost constantly on the wing, as they dart in the bright sun they display their brilliant colors.

Each rapid movement gives a different dye;
Like scales of burnish'd gold they dazzling show,
Now sink to shade, now like a furnace glow.

When hovering over a flower in which they are feeding, their wings are moved so rapidly that they become invisible, causing a humming sound, whence their common name, their bodies seeming suspended motionless in the air. They rarely alight on the ground, but perch readily on branches; bold and familiar, they frequent gardens in thickly settled localities, even entering rooms and flitting without fear near passers by; they are very pugnacious, and will attack any intruder coming near their nests. The nest is delicate but compact, and lined with the softest vegetable downs; it is about an inch in diameter, and the same in depth, and placed on trees, shrubs, and reeds. The eggs, one or

two in number, are small in proportion, averaging about $\frac{1}{2}$ by $\frac{1}{3}$ of an inch, generally of a white color, and hatched in 10 or 12 days. It is very difficult to keep these birds in cages; but they have been kept in rooms and conservatories, even in New England, for months, feeding on sugar or honey and water and the insects attracted by these, and have become so tame as to take their sweetened fluids from the end of the finger. They are incidentally honey-eaters, but essentially insectivorous; their barbed and viscid tongue is admirably adapted for drawing insects from the depths of tubular flowers, over which they delight to hover. The family of *trochilidæ* may be recognized by their diminutive size, gorgeous plumage, long, slender, and acute bill, but little cleft at the base, and peculiar tongue; the species are very numerous, probably as many as 400, some of which have a very limited range. The bill when closed forms a tube, through which the long, divided, and thread-like tongue may be protruded into deep flowers; there are no bristly feathers around its base, as in birds which catch insects on the wing; the tongue has its cornea elongated backward, passing around the back to the top of the skull, as in woodpeckers; the wings are long and falciform, with very strong shafts, the 1st quill of the 10 the longest; the secondaries usually 6; the tail is of various forms, but always strong, and important in directing the flight; the tarsi short and weak; the toes long and slender, and capable of sustaining them in a hanging position, as is known from their being not unfrequently found hanging dead from branches in the autumn after a sudden cold change in the weather. The sub-family *grypinae* have the bill slightly curved, and the tail long, broad, and wedge-shaped; of these the genus *phatornis* (Swains.) is found in the warmer parts of South America, and is numerous in species; *oreotrochilus* (Gould) inhabits the mountains of the western side of South America immediately beneath the line of perpetual snow, feeding upon the small hemipterous insects which resort to the flowers; *grypus* (Spix) is found in the neighborhood of Rio Janeiro. The curved-billed humming birds, more than 100 species, are not represented in the United States, unless the mango humming bird (*lampornis mango*, Swains.) be admitted; this may be distinguished from the common species by the absence of metallic scale-like feathers on the throat, and by the serrations of the end of the bill; the prevailing colors are metallic green and golden above, and velvety bluish black below, with a tuft of downy white feathers under the wings. The common species throughout the eastern states, extending to the high central plains and south to Brazil, is the ruby-throated humming bird (*trochilus colubris*, Linn.). The length of this "glittering fragment of the rainbow" (as Audubon calls it) is about $3\frac{1}{4}$ inches, with an extent of wings of $4\frac{1}{2}$ inches; the upper parts are uniform metallic green, with a ruby red gorget in the male, a white collar on

the throat, and the deeply forked tail brownish violet; the female has not the red throat, and the tail is rounded, emarginate, and banded with black. The corresponding species on the Pacific coast is the black-chinned *T. alexandri* (Bourc. and Mulsant). The last two belong to the sub-family of *trochilinae* or *mellisuginæ*, having straight bills; their genus is given by Gray as *mellisuga* (Briss.), of which there are more than 100 species. The largest of the humming birds belongs to this sub-family, and is the *hylocharis gigas* (Vieill.); it is nearly 8 inches long, brownish green above and light reddish below; the wings are longer than the deeply forked tail, and the general appearance is that of a brilliant swallow, with a long straight bill. Species of the genera *selasphorus* (Swains.) and *athys* (Reich.), 2 of each, are described by Prof. Baird in vol. ix. of the Pacific railroad reports. Those wishing to study in detail the complicated arrangement of this beautiful family are referred to the illustrated works of Lesson (*Histoire naturelle des oiseaux-mouches*, and *Les trochilidées ou les colibris*), Temminck (*Planches colorées*), Audubert and Vieillot, and especially to Gould's monograph on the *Trochilidæ*; also to vols. xiv. and xv. of the "Naturalists' Library."

HUMPHREY, HEMAN, D.D., an American divine, born in Simsbury, Conn., March 26, 1779. From the age of 16 he was engaged for several successive winters as a teacher in the common schools of his native state. He was graduated at Yale college in 1805, and immediately entered upon the study of theology, first under President Dwight, and afterward under the Rev. Asahel Hooker of Goshen, Conn. He was ordained in 1807 over the Congregational church in Fairfield, Conn., where he remained 10 years. Resigning this charge in 1817, he was installed as pastor of the church in Pittsfield, Mass. Six years afterward he was elected to the presidency of Amherst college, and was inaugurated to that office in Oct. 1823. When called to that institution, it was contending against adverse influences for a charter of incorporation, and its success in the succeeding year was greatly due to his influence and energy. He presided over Amherst college 22 years, and resigned his office in 1845, leaving the institution firmly established, and retired to his former home in Pittsfield, where he has since devoted his leisure chiefly to literary pursuits and to the promotion of the religious and benevolent enterprises of the age. President Humphrey has been for 50 years a frequent contributor to the periodical literature of his times. His earlier papers appeared chiefly in "The Panoplist" and "Christian Spectator." In 1830 he published a volume of prize essays on the Sabbath, which was republished in England. His other principal works are: "Tour in France, Great Britain, and Belgium" (2 vols. 12mo., New York, 1838); "Domestic Education" (1840); "Letters to a Son in the Ministry" (1845); "Life and Writings of Prof. W. Fiske" (1850); "Life and Writings of T. H. Gallaudet" (1857); "Sketches of the

History of Revivals" (1859). A collection of his public addresses and reviews has also been published, and a volume entitled "Revival Conversations." Dr. Humphrey was, if not the first, one of the earliest pioneers in the modern temperance reformation. In 1810 he preached 6 sermons on the ravages of intemperance; and in 1813, in connection with the Rev. Messrs. Swan and Bonney, drew up a report to the Fairfield consociation, which had a wide circulation, and is believed to have been the first tract published on that subject.

HUMPHREYS, a N. W. co. of Tenn., bounded E. by Tennessee river, and intersected near its S. border by Duck river, a tributary of the former stream; area, 375 sq. m.; pop. in 1850, 6,422, of whom 1,097 were slaves. The surface is moderately uneven, and the soil is fertile. The productions in 1850 were 419,387 bushels of Indian corn, 30,173 of oats, 23,149 of sweet potatoes, 11,045 lbs. of tobacco, and 89,656 of butter. There were 18 grist mills, 6 saw mills, 21 churches, and 1,922 pupils attending public schools. Capital, Waverley.

HUMPHREYS, **DAVID**, an American poet, born in Derby, Conn., in 1753, died in New Haven, Feb. 21, 1818. He was educated at Yale college, where he was connected with Dwight and Trumbull, entered the army at the beginning of the revolutionary war, and in 1780 became a colonel and aide-de-camp to Gen. Washington. He resided more than a year with Washington after his retirement to Virginia, and again in 1788. In 1784 he accompanied Jefferson to Europe as secretary of legation, was elected to the legislature of Connecticut in 1786, and was soon associated with Hopkins, Trumbull, and Barlow in the composition of the "Anarchiad," being thus one of "the four bards with Scripture names" satirized in London. He was minister to Lisbon from 1791 to 1797, and afterward minister to Spain till 1802, and on his return imported from Spain 100 merino sheep, and engaged in the manufacture of woollens. He held command of two Connecticut regiments in the war of 1812, after which he lived in retirement. His principal poems are: an "Address to the Armies of the United States" (1772); a "Poem on the Happiness of America;" a tragedy, entitled the "Widow of Malabar," translated from the French of Le Mierre; and a "Poem on Agriculture." His "Miscellaneous Works" (New York, 1790 and 1804) contain beside his poems a biography of Gen. Putnam and several orations and other prose compositions.

HUMUS (Lat. *humus*, the ground), a name of no definite signification, that has been applied to various compounds resulting from the decay of woody fibre or of different vegetable and animal substances, presented in the form of a brown pulverulent substance, as that which forms a large portion of vegetable mould. Boullay regarded it as identical with ulmic acid, but no definite compound is now recognized by this name, nor by that of humic acid, formerly separated from it.

HUMUYA, a river of Honduras, rising at the S. extremity of the plain of Comayagua, and flowing due N. for a distance of about 80 m. to a point near the town of Yojoa, where it unites with the rivers Blanco and Santiago or Venta, forming the great river Ulua, which falls into the bay of Honduras, about 25 m. to the eastward of the port of Omoa. For the greater part of its course it is a rapid stream, and only navigable for canoes. It is principally interesting in connection with the proposed interoceanic railway through Honduras, which is laid out through its valley. Comayagua, the capital of Honduras, stands on its E. bank.

HUNDRED, the name given in some parts of England to the subdivision of a shire, which may have received the appellation from having comprised 100 families, 100 warriors, or 100 manors. The existing divisions of this name differ greatly in area and population. The hundred is by some considered to have been a Danish institution, adopted by King Alfred about 897, each county being divided into tithings, of which 10 or 12 made a hundred, presided over by a decanus, head borough, or hundred-man. The hundreds were represented in the "shire-mote," which, under the presidency of its earl and bishop or sheriff, regulated the affairs of the county. The jurisdiction of the hundred was vested in the sheriff, although it was sometimes a special grant from the crown to individuals, and he or his deputy held a court baron, or court leet. The hundred was held responsible for felons until delivered up.

HUNGARY (Hung. *Magyarország*, Magyar land; Germ. *Ungarn*), a country of Europe, formerly an independent kingdom, subsequently united with Austria, and since 1849 a crownland or province of the latter. Before 1849 it embraced in a constitutional sense, beside Hungary proper, Croatia, Slavonia, and the Hungarian Littoral (coast land on the Adriatic), and in its widest acceptance also Transylvania, the Military Frontier, and Dalmatia, with an aggregate population of about 15,000,000. All these dependencies having been detached, and beside them from Hungary proper the counties of Middle Szolnok, Zaránd, and Kraszna, and the district of Kövár, to be reunited with Transylvania, and the counties of Bács, Torontál, Temes, and Krassó, to form the new crownland of the Servian Waywodeship and Banat, the crownland of Hungary in its most limited sense under Francis Joseph is bounded N. W., N., and N. E. by the Carpathians, which separate it from Moravia, Austrian Silesia, Galicia, and Bukovina, S. E. and E. by Transylvania, S. by the Waywodeship and Banat (from which it is partly separated by the Maros), by Slavonia and Croatia (from which it is separated by the Drave), and W. by Styria and Austria, being situated between lat. 45° 30' and 49° 40' N., and long. 16° and 25° E.; pop. about 9,000,000. Hungary in its chief parts forms a large basin surrounded almost entirely by mountain ranges, of which the principal are, the Carpathians, which encircle the north, with

their various offshoots, the ore mountains between the Waag and the Eipel, the Mútra, E. of the preceding, and the wine-growing Hegyalja between the Theiss and the Hernád; the Leitha range, the wooded Bakony, and the Vértes, mostly continuations of the Noric and Carnic Alps, in the S. W. division, and the Transylvanian Alps on the S. E. frontier. The chief artery of the country is the Danube, which enters it between Vienna and Presburg, and on its course to the Black sea receives the waters of all the other rivers, excepting only the Poprád, which rises near the N. boundary and flows to the Vistula. The principal of these affluents of the Danube are, on the right, the Leitha, Raab, Sárvíz, and the Drave, which separates Hungary proper from Slavonia, with the Mur, its affluent; on the left, the March, Waag, Neutra, Gran, Eipel, and the Theiss, which rises in the N. E., in the county of Mármaros, with its affluents, the Bodrog, Hernád, Sajó, and Zagyva on the right, and the Szamos, Kőrös, and Maros on the left. Most of the rivers of the now detached provinces also flow into the Danube, among others the Save on the Turkish frontier and the Alt from Transylvania. The S. W. division, which has the fewest rivers, includes the two great lakes of the country, the Balaton and the Neusiedler. Various marshes, moors, soda lakes, and swamps extend near the banks of the great rivers, especially of the Theiss. There are also numerous mountain lakes called "eyes of the sea," and caverns, of which that of Agtelek in the county of Gömör is the most remarkable. Extensive islands are formed by the branches of the Danube, among others the Great Schütt and Csepel in its upper course. The climate is in general mild, owing to the great northern barrier of the Carpathians. Often, when snow covers the northern mountain regions, the heat is considerable on the lowlands of the south, especially near the Maros. The climate of the great central plain resembles that of N. Italy; its sandy wastes, however, greatly contribute to the aridity of the summer winds. Blasts of wind and hail storms are not unfrequent in the Carpathians. The spring is the most agreeable season, but the autumn often partakes of the character of the Indian summer in the United States.—The fertility of the soil, with the exception of several mountainous and sandy regions, is almost extraordinary. Among the vegetable productions are: the different species of grain, especially wheat, which is equally abundant and excellent; maize, pulse, potatoes, cabbages, turnips, hemp, flax, rapeseed; exquisite melons, often of immense size, apples, pears, apricots, and plums; cherries, mulberries, chestnuts, filberts, and walnuts; tobacco, which is now monopolized by the crown; poppies cultivated for oil; wine of the most various kinds, including the delicious Tokay of the Hegyalja; almonds, figs, and olives, on the southern border; anise, Turkish pepper, sweet wood, safflower, madder, and other dye plants; numerous species of berries

in the greatest abundance; oaks, which yield large quantities of galls, the beech, fir, pine, ash, alder, and numerous other forest trees, often covering extensive tracts of land in the mountainous regions. Among the animals are the bear, wolf, lynx, wild cat, boar, chamois, marmot, deer, fox, hare; many fine breeds of horses and cattle (including buffaloes), dogs, sheep, and swine, the last of which are fattened in the forests on acorns. The birds comprise the golden and stone eagle, hawk, kite, bustard, heron, partridge, woodcock, nightingale, lark, and the common varieties of poultry in great abundance. Fish, bees, and leeches abound. Of minerals, there are gold, iron, and copper in large quantities; silver, zinc, lead, coal, cobalt, nitre, antimony, arsenic, sulphur, alum, soda, saltpetre, potassium, marble, crystal, chalk; salt in immense mines, especially in Mármaros; jasper, chalcedony, hyacinths, amethysts, agates, and beautiful varieties of opal (in Sáros). There are more than 300 mineral springs, of which those of Buda, Trencsén, Pöstyén, Bartfeld, Parád, and Szobráncz are among the most renowned. The chief articles of export are wheat, rapeseed, galls, honey, wax, wine, tobacco, copper, alum, potash, wood, cattle, sheep, swine, hides, wool, dried fruits, and brandies, especially *slivovitz* or plum liquor. For imports and manufactures Hungary relies mainly on Austria, the chief home manufactures, beside the working of metals, being linen and woollens, leather, paper, pottery and clay pipes, soap and candles, and tobacco. The means of communication are still very scanty, good roads being rare, and only few of the principal rivers sufficiently improved for navigation. Steamers ply on the Danube and Theiss; a central railroad with various branches connects the capital and chief commercial city Buda-Pesth with Presburg, Debreczin, Szegedin, &c. The principal seats of learning are at Pesth, which is also the literary centre, Presburg, Kaschau, Debreczin, Patak, Pápa, Veszprém, Miskolcz, Szegedin, Stuhl-Weissenburg, and Grosswardein. The higher grades of education, especially classical, are better provided for than elementary instruction.—The variety of nationalities and languages rivals that of productions. There are Magyars or Hungarians proper, the predominant race (about 4,500,000 in the limited crownland), chiefly in the fertile regions of the centre and in the S. W.; Slovaks (1,800,000) in the mountain regions of the N. W. and N., Ruthenians (450,000) in those of the N. E., Rascians (Servians), Slavonians, and Illyrians (together 100,000) in the S., Croats and Wends (100,000) in the S. W., all of Slavic race; Wallachs (650,000) in the S. E.; Germans (1,000,000) and Jews (350,000), chiefly in the towns of all regions; gypsies (50,000), settled in towns and villages, or migratory; beside Szeklers (properly Székelys) or Magyar borderers, Armenians, French, Bulgarians, &c., in the detached provinces. These various elements are distinguished not only by language, but also by peculiar costumes, manners, and moral characteristics. The character

of the principal races is well defined by Mr. Emerik Szabad in a recent sketch of the statistics and history of his country: "The Magyars, both nobles and peasants, are marked by oriental pride and nobleness, by love of liberty, hospitable customs, conviviality, and warlike spirit. Clinging with filial affection to his superiors, the peasant—a gentleman in language and bearing—is, at the same time, alive to the sense of his own worth. In field labor and horsemanship, the Magyars surpass all the rest. The Slavi of N. W. Hungary are mild, frugal, and industrious. The Rascians are in character very much like the Greeks, being, moreover, merry, warlike, and of fierce disposition. The Croats partake more of the character of the Rascians than of that of the north-western Slavi; and as to the Germans, they preserve their usual traits of industry and peaceableness. The most neglected race is, perhaps, the Wallachs. Strongly resembling in physiognomy the Italians, a fact clearly verifying their intermixture with the Romans, they, like the Slavi, are bony, and of a tall stature, and are considered as one of the least active races." Of the inhabitants about 4,700,000 are Roman Catholics, 750,000 United Greeks, 550,000 non-united Greeks, 1,750,000 Calvinists (Reformed, popularly Hungarian church), 900,000 Lutherans, and 350,000 Jews.—Politically, Hungary proper was divided down to 1849 into 4 natural divisions or circles, called, from the standpoint of Pesth, the Cis-Danubian (N. and E. of the Danube), Trans-Danubian (S. and W. of the Danube), Cis-Tibiscan (N. and W. of the Theiss), and Trans-Tibiscan (S. and E. of the Theiss), and subdivided into counties. Since the accession of Francis Joseph, however, the crownland is divided into the 5 circles of Presburg, Oedenburg, Pesth, Kaschau, and Grosswardein, named after their capitals, the subdivisions being maintained with few alterations. The following table exhibits both the historical and present divisions:

CIS-DANUBIAN CIRCLE.		
	Counties.	Principal Towns.
CIRCLE OF PRESBURG.	Presburg (<i>Pozsony</i>).	Presburg.
	Neutra (<i>Nyitra</i>).	Neutra.
	Trentschin (<i>Tren- csény</i>).	Trentschin.
	Árva.	Kubin.
	Turóc.	Rosenberg (<i>Szent Már- ton</i>).
C. OF PESTH.	Bars.	Kremnitz (<i>Körmöcz</i>).
	Liptó.	Szent Miklós.
	Sohl (<i>Zólyom</i>).	Schemnitz (<i>Sálmecz</i>).
	Hont.	Ipolyás.
	Nógrád.	Losoncz.
VOIVODINA.	Pesth (<i>Pest</i>).	Buda-Pesth.
	Gran (<i>Esztérgom</i>).	Gran.
	Bács.	Zombor.
TRANS-DANUBIAN CIRCLE.		
	Wieselburg (<i>Mosony</i>).	Altenburg (<i>Magyar- Óvár</i>).
CIRCLE OF OEDENBURG.	Oedenburg (<i>Soprony</i>).	Oedenburg.
	Eisenburg (<i>Fűs</i>).	Güns (<i>Kőszeg</i>).
	Zala.	Kapuvár.
	Somogy.	Fénfkirchen (<i>Pécs</i>).
	Baranya.	Szekszárd.
C. OF PRESB.	Tolna.	Pápa.
	Veszprém.	Raab.
	Raab (<i>Győr</i>).	Comorn.
C. OF PESTH.	Weissenburg (<i>Féjér</i>).	Stuhl-Weissenburg (<i>Székes Fejérvár</i>).

CIS-TIBISCAN CIRCLE.

	Counties.	Principal Towns.
CIRCLE OF KASCHAU.	Heves.	Erlau (<i>Eger</i>).
	Borsod.	Miskolcz.
	Gömör.	Rosennau (<i>Rozsnyó</i>).
	Zips (<i>Szepes</i>).	Leutschau (<i>Lecse</i>).
	Sáros.	Eperjes (<i>Eperjes</i>).
	Torna.	Torna.
	Abauj.	Kaschau (<i>Kassa</i>).
	Zemplén.	Ujhely.
GROSS-WAR- DEIN (<i>Nagy Yá- rad</i>).	Ung.	Ungvár.
	Bereg.	Munkács.
	TRANS-TIBISCAN CIRCLE.	
	Ugocsa.	Nagy Szöllös.
	Mármaros.	Sziget.
C. OF PESTH.	Szatmár.	Szatmár.
	Szatolcs.	Nyiregyháza.
	Ilihar.	Debreczin (<i>Debreczen</i>).
	Békes.	Gyula.
	Arad.	Old Arad.
BANAT.	Csanád.	Makó.
	Csongrád.	Szegedin (<i>Szeged</i>).
	Torontál.	Beeskerek.
	Temes.	Temesvár.
	Krássó.	Lugos.
Reannex'd to TRANSYLVANIA.	Middle Szolnok.	} Annexed parts.
	Kraszna.	
	Zaránd.	
	Kővár (region).	

ENCLOSED DISTRICTS

(on both sides of the middle and lower Theiss).
Great and Little Camania (*Kimság*).
Jazygia (*Jászág*).
Hayduk towns (*Hajdu-városok*).

—Among the nations who occupied parts of Hungary before its conquest by the Magyars or Hungarians, we find the Dacians, Bastarnæ, Illyrians, Pannonians, Sarmatians, Vandals, Bulgarians, Jazyges, Alans, Avars, Huns, Marcomanni, Gepidæ, Longobards, Goths, and Khazars. The Romans held the S. W. part of the country under the name of Pannonia, while the S. E. belonged to their province of Dacia. Various Slavic tribes, together with Wallachs, Bulgarians, and Germans, were the chief occupants at the time of the Magyar invasion. The Magyars, a warlike people of Turanian race, had made various migrations, and long dwelt in the vicinity of the Caucasian mountains, and afterward in the region between the Don and Dniester, before they approached and crossed the Carpathians (about 887) under the lead of Álmos, one of their 7 chiefs (*vezér*), and elected head (*fejedelem*) or duke. They were divided into 7 tribes and 108 families, had a compact, consecrated by oaths, which guaranteed justice and equality among themselves, and a religion which in various features resembled the Aryan element worship of the Medo-Persians, but also included the notion of a supreme Being (*Isten*; Gr. *εσσι*, Lat. *est*, Heb. *yesh*, Germ. *ist*, Slavic *yest*, is). Árpád, the son of Álmos, conquered the whole of Hungary and Transylvania, organized the government, and also made various expeditions beyond the limits of these countries, among others against Svatopluk of Moravia, being invited by the emperor Arnulph. These expeditions were further extended under his son Zoltán (907-946) and grandson Taksony (946-972), spreading terror and devastation as far as the German ocean, the south of France and Italy, and the Black sea. But various bloody defeats, especially near Merseburg (933) by the emperor Henry I., on the Lech (955) by Otho I., and in Greece (970), finally broke the desire of the Hungarians for booty

and adventurous exploits, and turned the attention of their princes to the consolidation of their power within the natural limits of the country. Gejza (972-997), the son of Taksony, who married a Christian princess, promoted the spread of Christianity, which was begun by numerous slaves and priests from the west and south, and almost completed under his son Stephen I. (997-1038), whose religious zeal gained him a crown and the title of apostolic king from Pope Sylvester II. (1000), and afterward the appellation of saint. Assisted by Roman priests, German knights, and numerous monks, he proclaimed the freedom of Christian slaves, introduced Latin schools, established bishoprics, built churches, chapels, and convents, elevated the bishops to the foremost rank in the state, compelled the people to pay tithes to the new clergy, and subdued the rebellious adherents of the national religion. The political and administrative institutions of the state were also organized, receiving already at that early period the principal features of the recently abolished Hungarian constitution. The original equality of the conquerors was limited by imitations of the western feudal aristocracy, and their various relations to the subdued people caused the introduction of numerous lower divisions. The higher clergy, the higher nobility, consisting of distinguished national families and of foreign lords, and the common nobility, embracing the bulk of the national warriors, were the ruling classes; the two former, together with the dignitaries of the state, the palatine (*nádor*), the court judge (afterward land judge), &c., formed the senate, or the higher division of the legislative body. The chiefs of the royal castle-environs (*vár-megyé*), out of which the counties were afterward developed, were the principal executive officers of the king. Against this new order of things, which included a foreign religion, a foreign language, numerous foreign institutions, and the frequent intermeddling of foreigners, the national party more than once violently rose both under Stephen and his successors, Peter (1038-46), against whom Aba Samuel was elected king, and who twice lost his throne, Andrew I. (1046-61), who perished after being defeated by his brother Béla, and Béla I. (1061-63), under whom the resistance of the defenders of the ancient religion was finally broken. The frequent bloody civil strife were not only kept up by the undefined succession to the throne of the house of Árpád, but also fomented by the intervention of the popes and the emperors. The emperor Henry III. in the reign of Andrew repeatedly invaded the country. The son of the latter, Solomon, who succeeded his uncle (1063-74), lost his throne chiefly in consequence of his ill treatment of his gallant cousins and successors Gejza (1074-77) and Ladislas (1077-95), to whom he owed his elevation, and some splendid victories over invaders; and he vainly applied for aid both to the emperor Henry IV. and his antagonist Pope Gregory VII., who each

claimed the rights of suzerainty over Hungary. He died in exile. Ladislas was equally brave and pious. He is a saint in the Roman calendar, and his victories over the Cumanians, who invaded Transylvania and the neighboring districts, and the conquest of Croatia and Halicz (eastern Galicia), made him one of the favorite princes of his nation. His nephew Coloman (1095-1114), surnamed the Scholar, was an enlightened and able ruler. He introduced various reforms, refused to accept the lead of the first crusade, closely watched the hosts which passed through his country, and routed or repulsed the more disorderly, though he received Godfrey of Bouillon as a friend. He annexed Dalmatia, but stained the close of his reign by cruelty toward his brother Álmos, who conspired against him. His son, the profligate Stephen II. (1114-31), waged war against almost all his neighbors. Béla II., the Blind (1131-41), the son of Álmos, and like his father the victim of Coloman, took bloody revenge on his former enemies on the occasion of the diet at Arad. Under his son Gejza II. (1141-61) numerous Saxon colonies were settled in the Zips and Transylvania, while their countrymen who joined the second crusade desolated the regions through which they passed. The disputed rights to Galicia and Dalmatia, and the often changing relations with the Byzantine empire, were now sources of frequent wars in the north and south. Stephen III. (1161-73), Gejza's youthful son, who overcame the intrigues of Manuel Comnenus and the opposition of two rivals, Ladislas II. and Stephen IV., but succumbed to poison, was succeeded by his brother Béla III. (1173-96), who, having been educated at the Greek court, and supported by it, introduced various imitations of its administrative organization, and was successful in Galicia, as well as in Dalmatia against the republic of Venice. His connection with the West in consequence of his marriage with Margaret of France induced numerous noble youths to visit the chief cities and schools of France, England, and Italy. His son Emeric (1196-1205) was tormented by the revolts of his brother Andrew, and in vain had his son Ladislas III. crowned before his death. Andrew II. (1205-35) was successively under the influence of his unscrupulous wife, who finally was assassinated; of the pope, who compelled him to undertake a crusade; of his financiers, Christian, Saracen, and Jewish, who monopolized the revenues of the impoverished kingdom; of the nobility, who in 1222 extorted from him the "golden bull," a Hungarian "Magna Charta" of freedom and privileges, including the right of armed resistance to tyranny; and finally of a combined violent opposition, to which belonged his son and successor Béla (IV.). The long reign of the latter (1235-70) commenced with salutary reforms, but was afterward disturbed by the immigration of the Cumanians and the invasion of the Tartars, who annihilated the Hungarian army on the Sajó (1241), and marked their way from the Carpathians to the Adriatic

by sword and fire, famine and pestilence. Béla did his best to restore order and repopulate the country by new immigrants, bestowed various rights on the cities, and promoted the culture of the vine; but his wars with Austria, Styria, &c., and the revolts of his son Stephen, destroyed order, and promoted only the usurpations of the high nobility. Stephen V. (1270-72) was successful against Ottokar of Bohemia. His son Ladislas IV. (1272-90), who succeeded at the age of 10, caused violent commotions and endless misery by his Cumanian amours and predilections, and was murdered at the instigation of one of his mistresses. A nephew of Béla IV., Andrew III. (1290-1301), was the last of the Árpáds, and after a disturbed reign, which various diets held on the plain of Rákos near Pesth could not consolidate, died probably by poison. The throne was now open for competition, and the royal dignity became purely elective. Charles Robert of Anjou, a nephew of the king of Naples, and by his mother a descendant of the extinct dynasty, being supported by the see of Rome, was the first elected; while another party, the leader of which was the powerful count Matthias Csák, successively elected Wenceslas, son of the king of Bohemia (1301-5), and Otto of Bavaria (1305-8), both of whom were by a similar title descendants of the Árpáds. Charles Robert's reign (1309-42) was marked by great successes at home and abroad. The regal power was extended and consolidated chiefly by a new military and financial organization; western refinement and luxury made the Hungarian lords more docile, and the succession to the thrones of Poland and Naples was secured to the two sons of the king, Louis and Andrew. Visegrád, however, which replaced Stuhl-Weissenburg as the royal residence, witnessed many a princely crime. Buda became a still more splendid residence under Louis, surnamed the Great (1342-82), who further developed the regal power, but with it the oppressive feudal institutions; and excepting his repeated expeditions to Italy to revenge the assassination of his brother Andrew by his own wife, Johanna, was successful in all his undertakings, conquering among other territories Moldavia and Bulgaria, and after the death of his uncle Casimir the Great of Poland, the last of the Piasts (1370), having the Adriatic, the Black sea, and the Baltic as boundaries of his states. He was chivalrous, luxurious, and bigoted; he promoted commerce, but burdened the peasants, persecuted the Cumanian pagans, and expelled the Jews, whom, however, his son-in-law Sigismund of Luxemburg brought back into the country. This prince having liberated his wife Mary, who had got rid of a rival, the Neapolitan Charles the Little, by assassination, but subsequently lost her throne and freedom, reigned together with her (1387-95), and after her death alone (1395-1437), being also elected German emperor, and succeeding to the throne of his house in Bohemia. His long reign was full of civil strife, including the Hussite war in Bohemia, a revolt in Hungary,

which for a short time deprived him of his liberty, and a rising of the peasants in Transylvania, and of wars against Venice and the Turks, who under Bajazet routed him in the battle of Nicopolis; but it was also marked by some salutary reforms in favor of the lower classes. Sigismund was succeeded by his son-in-law, the emperor Albert (II.) of Hapsburg (1437-9), who soon died after an unsuccessful campaign against Sultan Amurath, leaving his thrones to his pregnant wife Elizabeth. Unable to defend them, Sigismund's daughter now offered her hand to Ladislas III. of Poland, the crown of which country had been given with the hand of Hedvig, the younger daughter of Louis the Great, to Jagiello of Lithuania, the father of Ladislas. The young Polish king after some struggle became also king of Hungary under the name of Uladislav I. (Polish *Wladyslaw*, Hung. *Ulászló*, not *László*, Ladislas), but after several glorious victories of his great general John Hunyady over the Turks, fell in the bloody battle of Varna (1444), having broken his oath of peace to the infidels. Ladislas (V.), the posthumous child of Albert, whom his mother Elizabeth, shortly before her death, had carried together with the crown to her brother-in-law, the emperor Frederic III., was now acknowledged as king (1445-57), the heroic Hunyady being appointed governor or regent (1446-53). Frederic of Hapsburg, however, had to be compelled to restore the prince; powerful lords, Giskra in the N. W., Ulric of Cille in the S. W., Ujlaky, Garay, and others, caused endless disturbances, and the Turks menaced Hungary, while preparing to strike the last blow at the Byzantine empire. Hunyady himself was defeated, but made good his escape, and died victorious, having repulsed Mohammed II., the conqueror of Constantinople, from the walls of Belgrade (1456). Of his two sons, Ladislas was treacherously imprisoned and executed by command of the ungrateful and weak king, but Matthias, surnamed Corvinus, ascended the throne after the death of the latter and a protracted election struggle. The ablest monarch of Hungary (1458-90), he humiliated its enemies at home and abroad, subduing the rebellious lords, and alternately vanquishing in numerous campaigns the emperor, Podiebrad of Bohemia, and the armies of Mohammed II. He restored order, law, and prosperity, promoted science and art more than any other prince of his age, and administered his kingdom with an impartiality the glory of which survived him in the popular adage: "King Matthias is dead, justice gone." Not only justice, but also the might, prosperity, and splendor of the country were gone with Matthias; the flourishing schools decayed, the scientific collections were scattered. The indolent Uladislav (II.) of Bohemia (1490-1516) was as poor as he was contemptible, and let his lords do as they chose. Of these John Zápolya, waywode of Transylvania, suppressed with dreadful bloodshed a great insurrection of the peasantry under Dózsa (1514). Under the young

and weak son of Uladislas, Louis II. (1516-'26), the country gradually ripened for a catastrophe. While the nobles disputed, Belgrade fell, and finally the battle of Mohács was rashly fought against Sultan Solymán the Magnificent. The Hungarian army was destroyed, Louis perished on his flight, and his wife, the sister of Ferdinand of Austria, hastened to carry the crown to her brother. This prince inaugurated the still reigning dynasty of the Hapsburgs, being acknowledged as king (1526-'64) by the nobility of the western counties, while the national party elected John Zápolya (1526-'40), who prevailed in Transylvania and the adjoining parts. The latter put himself under the protection of Solymán, who took Buda and even besieged Vienna (1529). Long campaigns and negotiations and short-lived treaties now followed each other, the final result of which was that Hungary was for about 150 years divided into 3 parts with often changing limits, under the Hapsburgs as kings, each of whom swore allegiance to the constitution, and none of whom kept his oath, the pashas of the sultans, who often made conquering or predatory expeditions, and the princes of Transylvania, who, though under the vassalage of the sultans, became the champions of Hungarian nationality, religious liberty, and Protestantism. The greater part of Hungary proper, however, including the whole N. W., was in the hands of the royal or imperial armies, the monarchs holding also the crown of Germany after the abdication of Charles V., and finding many a hero among their Hungarian subjects. Thus during the war with the Turks in 1552 Losonczy immortalized himself by the defence of Temesvár, Szondy by that of Drégely, Dobó by that of Erlau. Maximilian (1564-'76) was saved by the self-sacrificing heroism of Zrínyi, who fell with his little fortress Sziget and the last of his men only after the death of the besieger Solymán and the destruction of a part of his army (1566). All these services of the magnates, as well as of the nation, were repaid with ingratitude by the Austrian dynasty. The diets of Hungary, which for centuries remained the blood-covered bulwark of Christendom, more than once had to complain that the imperial soldiery did more to devastate the country and famish the people than the infidel conquerors. Rudolph I. (1576-1608) commenced the persecution of the Protestants. These, however, not only had a free home in Transylvania under the enlightened Stephen Báthori, afterward king of Poland (who had succeeded the younger Zápolya), but also a protector of their rights in Hungary in Bocskay, the Transylvanian successor of Sigismund Báthori, who suddenly raised the banner of freedom, sweeping all over the north, crushing the generals of Rudolph, and finally compelling the latter to the humiliating peace of Vienna (1606). The old emperor finally resigned his Hungarian crown to his brother Matthias (II.), whose tolerant reign, however, was too short for the pacification of the country

(1608-'19). His successor Ferdinand II. (1619-'37), who commenced his bloody reign amid the first flames of the 30 years' war, was prevented from tearing the Hungarian charter of liberty, as he did the Bohemian, by the rekindled spirit of the nation and the victories of the Transylvanian prince Gabriel Bethlen, the successor of the profligate tyrant Gabriel Báthori, who soon compelled him to the treaty of Nikolsburg (1622), which again sanctioned the rights of the Protestants. A similar treaty was concluded by Ferdinand III. (1637-'57) with George I. Rákóczy of Transylvania at Linz (1645). Leopold I. (1657-1705), whose long reign in Hungary was but a series of wars, insurrections, and executions, found a less able opponent in the ambitious George II. Rákóczy of Transylvania, and excellent generals against the Turks in Montecuculi, who gained the battle of St. Gothard (1664), and Nicholas Zrínyi (the poet), but made an ignominious peace with the sultan, and had the distinguished leaders of a national conspiracy, Peter Zrínyi, Frangepán, and Nádasdy, executed in Austria (1671), and his minister Lobkowitz sent against the insurgents of the northern counties the bloodthirsty foreigners Spankau, Kobb, Caraffa, and Strasoldo. The people rose again "for God and freedom" under Tökölyi (1678), who, being allied with Apafi of Transylvania, the Porte, and Louis XIV. of France, was near uniting the whole of Hungary under his banner, when the reverses of the Turks before Vienna (1683), where John Sobieski of Poland saved the throne of the imbecile emperor, at Párkány and Gran, the conquest of Buda (1686) after a memorable siege under Louis of Baden and Maximilian of Bavaria, who were assisted by the choicest Christian warriors from various countries, and the subsequent victories of the imperialists, sealed the fate of the insurrection. Caraffa made the scaffold permanent in Eperies; the diet of Presburg had to consent to the demands of the emperor in making the throne hereditary in the house of Austria and abrogating the clause of the golden bull which guaranteed the right of resistance to oppression (1687); Prince Eugene completed the victories over the Turks, and conquered the peace of Carlowitz (1699); Transylvania was occupied, and Tökölyi, who tried in vain to recover it, died in exile in Asia Minor. His heroic wife, the daughter of the executed Zrínyi, had been compelled to surrender her long defended fortress Munkács. Hungary was now a province of Austria, and treated as such, when the noble-hearted Francis Rákóczy, who had long lived in exile, suddenly appeared on the N. E. borders (1703), and renewed the struggle for religious and civil liberty. Protestants and Catholics flocked to his banners, which were triumphantly carried into the very vicinity of Vienna, when the emperor died. His son Joseph I. (1705-'11) was inclined to peace, and Rákóczy was not opposed to it, though assisted by Louis XIV. and the perplexities of the new emperor in the war of Spanish succession.

Diets and negotiations followed each other, but without success, while the victories of Eugene and Marlborough and violent dissensions in the camp of the insurgents enabled the emperor to restore the fortunes of the war in Hungary. In the absence of Rákóczy, who after various defeats had gone to Poland to procure the alliance of the czar Peter, now victorious over Charles XII., a peace was finally concluded at Szatmár (1711) by Károlyi and other leaders of the insurgents, with the patriotic count Pálffy, who acted in the name of the emperor. The latter, who promised toleration and a strict observance of the constitution, had died in the meanwhile, and his successor Charles (VI. as emperor, III. as king, 1711-'40) ratified the treaty, while Rákóczy absolved his followers from their oath of allegiance to him. The new emperor's favorite scheme, the pragmatic sanction, which was to secure the succession of the female line to all his possessions, was agreed to by the diet of 1722, which also enacted various other important laws. The peace of Passarovitz (1718), the result of Eugene's new victories, enlarged the kingdom with the Banat, the last province of the Turks in Hungary; but after another war Belgrade was ceded to the Turks by the treaty concluded in that city in 1739. Charles's mild reign disposed the nation to defend the disputed rights of his daughter Maria Theresa (1740-'80), who appeared in person before the diet of Presburg, and was greeted with lively acclamations by the chivalric nobles. Their *Moriamur pro rege nostro Maria Theresa* was no vain promise, for Hungarian blood was shed profusely in her wars against Frederic the Great and other enemies. She rewarded the fidelity of the people by mildness, and various ameliorations of the condition of the peasantry (the *Urbarium*) are among the merits of her reign; but she too was far from strictly observing the constitution, which her son Joseph II. (1780-'90), in his immoderate zeal for reforms and centralization, was eager to destroy. To avoid binding himself by the constitutional oath, he refused to be crowned in Hungary, autocratically dictated his liberal reforms, and imposed upon the country foreign officials, a foreign language, the German, and foreign official costumes. But his violent though well meant measures were opposed everywhere, and the rising in his Belgian provinces, the unfavorable issue of his war against Turkey, and finally the threatening events in France, compelled the philanthropic despot to revoke his decrees shortly before his death. His mild and dissolute brother Leopold II. (1790-'92), afraid of the growing storm in the West, hastened to appease the Hungarian nation, which had been aroused by ignominious treatment and the spectacle of its perishing neighbor Poland to a general desire of national regeneration. The diet of 1791 again sanctioned the most essential constitutional rights of the kingdom in general, and of the Protestants in particular, and for a series of years Francis, the son and successor of Leopold (1792-1835), was satisfied

during his long wars against republican and imperial France with the continual subsidies of Hungary in money and men, including the hussars, whom even Napoleon acknowledged to be the bravest in the ranks of his enemies. The rare manifestations of democratic convictions he stifled in the dungeons of his fortresses, or, as in the case of the priest Martinovics (1795), in the blood of the offenders. The magnates were flattered and remained faithful. Thus Napoleon in vain called upon the Hungarians to rise for national independence. The last "general rising" of the nobility was the answer (1809), but proved at the same time how incapable the old spirit was of being revived. Scarcely, however, had the dangers passed which so long threatened the crowns of Francis, when his minister Metternich made it one of his principal tasks for the restoration of the shaken and bankrupt Austrian empire to undermine the constitution of Hungary, the only check on the unlimited sway of the rulers. Every means, secret or open, was resorted to, but in vain. The progress of enlightenment, the warning example of Galicia, that withering limb of Poland torn from its body by Austria, and the spirit of nationality, rekindled by the activity of Francis Kazinczy and others, had prepared the nation for a struggle for constitutionalism and liberal reforms, which Metternich, both under Francis and his imbecile son Ferdinand V. (I. as emperor of Austria, 1835-'48), was unable effectively to resist. The Hungarian constitution had during the last few centuries undergone numerous modifications, without having at any period of its existence lost its vitality. As it was now, it was at the same time a charter of freedom, which shielded the people at large against the tyrannical sway of the princes and their ministers, against oppressive taxes and levies, and especially the Protestants and Jews against the proscriptive system which prevailed in Austria, and secured to the numerous nobility the greatest degree of personal liberty and immunity enjoyed by any class in Europe, and on the other hand an instrument of oppression in the hands of the nobility against all plebeian inhabitants of the country, especially the peasantry, which was degraded by numerous feudal burdens. The nobles were free from every tax and personal service, except in case of a hostile attack on the country itself, when they were obliged to rise in a body at their own expense; they enjoyed all the privileges of the right of *habeas corpus*, governed the counties by their regular assemblies ("congregations") and court sessions, electing the vice-counts, administrative judges, court assessors, &c., and exercised the right of legislation by their deputies to the lower house of the diet, two from each county, who in important questions were bound by the instructions of their constituents. The higher nobility, or magnates, dukes, counts, and barons, together with the chief dignitaries of the crown, the Catholic and Greek bishops and some other prelates, and the county presidents or lord lieutenants, formed

the upper house of the diet under the presidency of the palatine. The absent magnates were represented in the lower house by proxies, who, however, like some other minor members, had only a deliberative vote; while the deputies of all free royal towns, which had their own separate domestic administration, could cast only one decisive vote. The diet, which in the earliest times had been held at Stuhl-Weissenburg or on the plain of Rákos before Pesth, and during the Turkish and civil wars in various cities, was now regularly convoked by the monarch at Presburg, at intervals not exceeding 3 years. Its duration was unlimited. Beside general legislation, it voted the various non-domestic contributions of the country, the refusal of which was the most effective weapon against the Vienna government. The concurrence of both houses and the royal sanction were necessary for all enactments. The chief royal organs of general administration were the Hungarian aulic chancery at Vienna, and the royal council at Buda, whose decisions, however, very often met with opposition or delay in the county assemblies. This *vis inertia* of the latter was the principal check on all despotic or unconstitutional attempts of the ministers, while their publicity and jealously guarded freedom of debate were the chief elements of progress and political enlightenment. Gradually to abolish the immunities of the nobles and the feudal burdens of the peasantry, to endow the great bulk of the people with political rights, and at the same time to fortify the old bulwarks of the constitution, now became the task of the patriots; and the great movement offered the rare spectacle of an aristocracy contending for the abolition of privileges and the equality of the people. Paul Nagy and Count Stephen Széchenyi were the champions of nationality at the diet of 1825, which inaugurated a long period of moderate but gradual reforms, the most important of which were carried through at the diets of 1832-'6, 1839-'40, and 1843-'4. The rights of the non-noble citizens, peasantry, and Jews, the equality of the Christian confessions, the official use of the Hungarian language, and the freedom of speech were extended, the majority of the educated lower nobility and a minority of the higher ardently contending against old abuses and aristocratic immunities, against bureaucratic despotism and religious intolerance. Among the chief leaders of the "liberal opposition" under Ferdinand were the members of the upper house Count Louis Batthyányi, Count Zay, and Baron Eötvös; the deputies Deák of Zala, Bezerédy of Tolna, Beöthy of Bihar, Klauzál of Csongrád, Palóczy and Szemere of Borsod, Szentkirályi and Ráday of Pesth, Balogh of Bars, and Kubinyi of Nógrád; the great Transylvanian agitator Baron Wesselényi, and the publicist Kossuth. The cabinet of Vienna chose the last five as its victims, prosecuting them for treason, and imprisoning Wesselényi and Kossuth for years. The old palatine Joseph, the uncle of the emperor, and the conservatives under the lead of

Counts Aurel and Emil Dessewffy, as well as of the moderate Széchenyi, in vain strove to check the agitation. It reached its culminating point when Kossuth, after a lively struggle, was elected as representative of Pesth to the diet of 1847. Europe was agitated; the last rising of Poland (1846) had been suppressed by a massacre of the nobles in Galicia, and the republic of Cracow annihilated; the Swiss confederation was convulsed by a civil war; Pius IX. had given the signal for constitutional movements in Italy; Sardinia was arming against Austria, and France preparing for a new struggle. Kossuth proposed extensive reforms, and was ardently supported by the house of deputies and the nation. A conflict with the government seemed imminent, when the general shock which followed the French revolution of February overthrew the rule of Metternich (March 13, 1848). Kossuth was greeted as liberator by the people of Vienna, and together with L. Batthyányi intrusted with the formation of an independent Hungarian ministry by Ferdinand. The people of Pesth, under the lead of the youthful poet Petöfi, delivered in triumph the plebeian martyr for freedom Stancsics, proclaimed the liberty of the press, and the radical "wishes of the nation" (March 15). The new ministry embraced its favorites; Batthyányi was president, Kossuth was minister of finance, Széchenyi of public works, Deák of justice, Eötvös of public worship and education, Szemere of home affairs, Klauzál of commerce, and Mészáros of war, beside Prince Paul Esterházy as *quasi* minister of foreign affairs in Vienna. Having enacted the abolition of feudalism, a new election law, and various other radical changes in the constitution, the last diet of Presburg dissolved, the new national assembly being appointed to meet in July at Pesth. The national government, however, whose animating spirit was Kossuth, was from the beginning surrounded by open and secret enemies, and endless difficulties and embarrassments. The cabinet of Vienna commenced its intrigues against the new order of things on the very day when it sanctioned it. Jellachich and others were sent openly or secretly to organize an insurrection of the southern Slavic tribes, which had long been worked upon by a threefold national agitation, by the tools of the Austrian government against the Magyars, by popular enthusiasts in the interest of a democratic Pan-Slavic union, and by Russian emissaries in the interest of a similar union under the rule of the czar. Secret agents prepared a rising of the Wallachs in Transylvania, the diet of which proclaimed its reunion with Hungary. Dangerous tumults broke out in various German cities and among the Slovaks of the Waag. The forresses and the foreign soldiery in the country were commanded by Austrian officers, and the Hungarian regiments were retained in Italy and Galicia. There were no national finances, no arms nor arm founderies. Every new measure met with opposition or delay through the

Vienna government or its tools. Negotiations had no result. The whole south of the country was soon in a flame. The Rascians rose in the Military Frontier, in the Banat and Bács, and the Wallachs in Transylvania, the Saxons also declaring for Austria; Croatia and Slavonia proclaimed their independence of Hungary, and Ban Jellachich occupied the Littorale, and threatened to cross the Drave. Against all these contingencies the only resource of the government was its own zeal and the enthusiasm of the people. Volunteer troops (*honvéds*, defenders of the land) were raised in the counties, rich contributions toward a national treasury were collected, and the militia was organized. The diet assembled in July, and voted extensive levies and ample means for defence, but Ferdinand refused to sanction its resolutions. The Austrian troops which were still sent against the insurgents were led by traitors. Even Mészáros was repulsed from Szent Tamás by the Rascians in August; the new troops were slowly gathering. Jellachich finally crossed the Drave, and the Vienna government, having reconquered Lombardy, threw off its mask in September, and sent Count Lamberg to disperse the diet by force. The Bathányi ministry now resigned, and a committee of defence was formed under the presidency of Kossuth. The revolution began. The old troops were transformed and blended with the new. Kossuth's ardent eloquence brought the people of the central plain under arms. Single detachments of Hungarian troops returned with or without their officers from abroad. Comorn was secured. Archduke Stephen, the new palatine, fled from the country. Lamberg was massacred on the bridge of Pesth by a mob. Jellachich was defeated at Pákozd near Buda by the motley national army under Móga (Sept. 29) and fled toward Vienna, which rose in revolution (Oct. 6). Perczel and Görgey surrounded and disarmed at Ozora the isolated Croatian corps under Roth and Philippovics (Oct. 7). The fortresses, Comorn, Eszék, Peterwardein, Leopoldstadt, and Munkács, hoisted the national flag. On the other hand, Rukavina in Temesvár and Berger in Arad hoisted that of Austria, and made common cause with the Rascians, who committed frightful massacres. The war of races raged with terrible fury and varying success. Transylvania was entirely lost. The pursuit of Jellachich was executed with hesitation by Móga, a late Austrian general, the frontier river Leitha was crossed too late, and the hastily collected volunteers fled after a short fight at Schwechat (Oct. 30) against Windischgrätz and Jellachich, who thus became masters of Vienna. Katona, sent to reconquer Transylvania, was routed at Décs (Nov.). The Polish volunteers under Wysocki made unsuccessful attempts to capture Arad. Count Schlick entered Hungary from the north, dispersed the Hungarian militia on the mountain before Keschau, and occupied that city (Dec. 11). The Rascian Damjanics alone led his valiant *honvéds*

to victory at Lagerndorf (Nov. 9), and Alibunáz (Dec. 17) on the S. E. frontier, while Perczel successfully defended the line of the Drave on the S. W. Unable to defend the W. frontier against Windischgrätz, Simunich, and Nugent, Görgey, the new commander of the army of the upper Danube, retreated on the right bank of that river, evacuating Presburg, Raab, and after the rout of the equally retreating Perczel at Moor (Dec. 29), and the engagement at Tétény (Jan. 3, 1849), the capital Buda-Pesth itself (Jan. 5). The day before, Schlick dispersed the undisciplined army of the north under Mészáros, the minister of war. Thus the government and diet, which transferred their seat to Debreczin, would have had little prospect of security if the Polish general Bem had not begun in the latter half of December a new Transylvanian campaign, which cheered the patriots with a nearly unbroken series of signal successes over the imperialists under Urban and Puchner. Görgey, too, who according to a new plan of operations returned westward on the left bank of the Danube, leaving a part of his troops with Perczel on the middle Theiss, succeeded in diverting the Austrian main army under Windischgrätz from a march toward the latter river, though not in rescuing Leopoldstadt, which surrendered. Then turning northward, he skilfully fought his way through the rugged region of the ore mountains, amid continual perils, and, after a signal victory of his vanguard under Guyon, who had already proved his heroism in many a previous battle, over Schlick's corps on Mount Branyiszko (Feb. 5), finally effected a junction with the army of the upper Theiss, which under Klapka had been successful against that Austrian general (Jan. 22, 23, and 31). Damjanics was recalled with his troops from the south, Perczel defended the middle Theiss, and Asztalos repulsed the Rascians on the Maros (Feb. 10). The activity of Kossuth and his associates in supplying all these bodies of troops with men, ammunition, money, and officers, while almost all parts of the country were alternately crossed by imperial and national armies, was admirable. The zeal of the committee of defence, however, was worthily responded to by the confidence of the people, who, even when two thirds of the country were in the hands of the enemy, almost as willingly accepted "Kossuth's bills" as specie, and by the general bravery of the troops, old and new, hussars, *honvéds*, and artilleryists. Order reigned in the midst of war; the prisons were empty. But new dangers arose with the invasion of the Russians from the Danubian principalities into Transylvania, where Bem, after a triumphant march (January) was suddenly checked before Hermannstadt, repulsed, threatened in the rear by Saxons, Wallachs, and the garrison of Carlsburg, and could save his position at Piski (Feb. 9, 10) only after the loss of a part of his heroic troops; and within the national camp by the stubborn disobedience and intrigues of Görgey, almost bordering on trea-

son, which caused the escape of Schlick from Kaschau, the unfavorable issue of the great battle of Kápolna (Feb. 26, 27), the retreat of the united main army beyond the Theiss, the deposition of its commander, the Pole Dembinski, at Füred, and a considerable loss of time. Another heavy loss was that of the isolated fortress Eszék, which was surrendered with immense stores by its cowardly commanders. Elated by the despatches of Prince Windischgrätz, the young emperor Francis Joseph, who had succeeded his uncle at Olmütz (Dec. 2, 1848), now promulgated a new constitution (March 4), which with one stroke annihilated the constitution and national independence of Hungary, making it, with narrowed limits, a crowland of Austria. But the next few days brought a new series of Hungarian victories. Crossing the Theiss in the night, Damjanics surprised and totally routed the Austrians at Szolnok (March 5). Bem by a sudden assault took Hermannstadt (11th), and on the anniversary of the "day of Pesh" (15th) drove the Russians and Puchner through the Red Tower pass into Wallachia. After the occupation of Cronstadt (20th), all Transylvania, except Carlsburg, was in the hands of the Polish general, under whom Magyars and Szeklers, Poles and Viennese students fought with equal bravery. Perczel swept over the Rascian Vendée, and stormed the ramparts of Sz. Tamás (March, April). The temporary chief commander of the main army, Vetter, having fallen ill, Görgey finally received the command, and the offensive against Windischgrätz was resumed. Commanded under him by Damjanics, Klapka, Aulich, Wysocki, &c., the army crossed the Theiss at various points, and, advancing toward the capital, defeated the enemy at Hatvan (April 2), Bieske (4th), and Izsaszeg (6th), and, leaving a corps under Aulich before Pesth to cover the main body, suddenly turned toward Waitzen, took it by assault (10th), routed the Austrians at Nagy Sarló (19th), rescued Comorn, which had withstood a long siege and bombardment, and crossing the Danube, gained a victory at Ács (26th). Schlick, Windischgrätz, Jellachich, Götz, who fell at Waitzen, Wohlgemuth, and Welden were thus successively defeated in this short campaign, during which the diet at Debreczin proclaimed the independence of the country (April 14), appointing Kossuth its governor, and Aulich entered Pesth. Beniczky and a younger brother of Görgey cleared the mountain region of the N. W. Instead, however, of continuing his victorious march to the capital of the enemy, Görgey returned with the bulk of his army to the siege of Buda, which had been strongly fortified and was strenuously defended under Henzi, while a new and extensive Russian invasion was approaching. Buda was finally stormed (May 21), Henzi being mortally wounded, the government and diet returned to the capital, and Görgey again took the field; but, bent on intrigues against Kossuth, the new presiding minister Szemere, Dembinski, who commanded in the north, and

his own generals, he chose the N. bank of the Danube for his new campaign, which suited his political schemes, and, without profiting by Kmetty's victory at Csorna, S. of that river (June 13), wasted the blood of his army on the Waag. The Russian armies and fresh Austrian troops under Haynau were in the meanwhile pouring into the country from various quarters. Wysocki, the successor of Dembinski in command, retreated before Paskevitch; Temesvár was unsuccessfully besieged by Vécsy; Bem was paralyzed by a new and more terrible rising of the Wallachs, while his province, too, was invaded by the Russians. After various unsuccessful struggles on the line of the Waag (June 16, 17, 20, 21), the loss of Raab, (28th), and the great battle of Szöny (July 2), Görgey, leaving Klapka in Comorn, finally retreated toward the middle Theiss; but after a bloody fight against Paskevitch at Waitzen (15th), he turned northward, again and again repulsing the Russians, and crossed the Theiss at Tokaj. The Russians crossed it at Füred, while the central Hungarian forces under the chief command of Dembinski retreated toward Szegedin, where they were joined by Guyon, who had routed Jellachich at Kis Hegyes (14th). The government leaving the former place, where the last session of the diet had been held, retired to Arad, which, having recently surrendered, was made the last point of general concentration, after the rout of Bem at Schäßburg by the Russians under Lüders (29th), of one of Görgey's divisions under Nagy-Sándor, before Debreczin by the army of Paskevitch (Aug. 2), and of Dembinski at Szőreg by Haynau (3th). Dembinski, however, retreated toward Temesvár, where his army suffered a terrible defeat (9th). Görgey, who now arrived at Arad, summoned Kossuth to resign, and received from him the supreme civil and military command (11th), Klapka's sally from Comorn and signal victory over the besieging Austrian army (3d) being unknown at Arad. Two days later Görgey surrendered his army at discretion to the generals of the czar at Világos (13th). Damjanics followed his example, and surrendered Arad (17th). Kossuth, the late ministers Szemere and Casimir Batthyányi, the generals Bem, Dembinski, Mészáros, Vetter, Perczel, Guyon, Kmetty, Wysocki, and others, fled into Turkey. Munkács, Peterwardein, and Comorn capitulated. But scarcely had the tricolor disappeared from the ramparts of the last named fortress (Oct. 4), when the work of revenge commenced on the side of the victors. Count Louis Batthyányi, who had been made captive on a mission of peaceful mediation, was executed at Pesth (6th), and the generals Kis, Aulich, Damjanics, Nagy-Sándor, Török, Lahner, Vécsy, Knézhich, Pöltenberg, Leiningen, Schweidel, Dessewffy, and Lázár, all of whom had surrendered at discretion, were executed on the same day at Arad. The old president of the upper house at Debreczin, Baron Perényi, Szacsay, Csernyus, Giron,

Abancourt, the young Polish prince Woroniecki, the revolutionary minister Csányi, and Baron Jessenák were executed at Pesth a few days later, like most of the preceding, on the gallows. Col. Kazinezy was shot at Arad. Other executions followed. The dungeons of the empire were filled with prisoners for life or a long term of years, including priests, officers, and government officials of every confession, rank, and age. Görgey was confined at Klagenfurth. The remnants of the Hungarian troops were impressed into the Austrian army, and the estates of the rich patriots confiscated. The country remained under martial law, receiving new divisions, authorities, and tax regulations, and foreign officials. The German was made the language of the reorganized higher courts, offices, and schools. New contributions, military levies, and so called voluntary loans, followed each other. A conspiracy and an attempt on the emperor's life led to the resumption of wholesale executions in 1853, among the more distinguished victims being Libényi, Jubal, Sárközi, Andrásfi, and Noszlopi. The Protestants and Jews were subjected to particular restrictions. Thus in spite of various scanty amnesties, and two journeys of the emperor through the country, the feelings of the nation remained hostile to Austria, and the attack on the latter by France and Sardinia in the spring of 1859 became the signal for national agitations abroad (under Kossuth, Count Ladislas Teleky, Klapka, and others) as well as at home, which, after the sudden discomfiture of all sanguine hopes by the agreement of Villafranca, concentrated themselves in a moderate but steady opposition to the new religious, financial, and municipal measures of the Vienna ministry, chiefly under the lead of the "old conservatives," and in peaceful but general demonstrations of the people. Of the latter the centennial celebration of the birthday of Francis Kazinezy (Oct. 27, 1859), in commemoration of his literary activity, his martyrdom for freedom being understood, was the most significant. Soon after numerous arrests took place throughout the country, and the 5th Austrian army corps was recalled from Italy to be placed at the disposal of the governor, Archduke Albert (Dec. 1859).

HUNGARY, LANGUAGE AND LITERATURE OF. The Hungarian language (Hung. *Magyar nyelv*) is an isolated branch of the Altaic, or Uralo-Altaic, or Tartaro-Finnic family, constituting a peculiar group with the now extinct idioms of the Uzes, Khazars, Petchenegs, and ancient Bulgarians. Leo Diaconus (10th century) called the Magyars Huns, and the people liked to consider themselves as such, being proud of Etele (Attila) and his brother Buda. The chronicle of the monastery of St. Wandrill and Dankovszki connect them both with the Huns and Avars; but De Guignes senior distinguishes them from the Huns, who were of Mongolian race. Some connect the Hungarians with both the Ugurs or Ighurs and the westerly Ogors, Ugurs, or Jugri. Both theories, based on the similarity of sounds,

are less probable than that which derives Ungar from *Ung-vár*, castle on the river Ung. There are also various derivations of the name Magyar from roots belonging to the Hungarian language, as *Mej-erő*, breast-strength, and *Mag-gyar*, seed-maker, agriculturist; but none of these is generally adopted by scholars. The Byzantine emperor Constantine Porphyrogenitus (905-959) names the people Turkoi. The Magyars and the Osmanlis agree in the belief that they are kindred, and the former are called "bad brothers" by the latter for having resisted them. Spittler contends that the Magyars are Calmucks. The Franciscan Du Plan de Carpin (1246) calls Bashkiria *Magna Hungaria*, and the Minorite Ruysbroek (1253) says that the Bashkir and Hungarian languages agree. Sajnovich (*Demonstratio Ungarorum et Laponum Idioma idem esse*, Copenhagen, 1770, and "Memoirs of the Danish Academy," t. x.), Ihre Oehr (*De Convenientia Linguae Laponicæ cum Hungarica*, Upsal, 1777), Sam. Gyarmathy (*Affinitas Lingue Hungaricæ cum Linguis Fennicæ Originis grammaticæ demonstrata*, Göttingen, 1799), Eccard, Hell, Gatterer, Schlözer, Büsching, Hager, &c., support the Finno-Estho-Lapponic affinity; while Oertelius (*Harmonia Linguarum, speciatim Hungaricæ cum Hebræa*, Wittenberg, 1746), Paul Beregszászy (*Ueber die Aehnlichkeit der ungarischen Sprache mit den morgenländischen*, &c., Leipsic, 1796), Otrokotsi, Kalmár, Verseghy, &c., contend for a Semitic pedigree of the Magyar language. Klaproth deduces it from a mixture of Tartaric or Turkish with Finnic. Malte-Brun considers the Magyars as Finns who were subjected to the Turks and to an unknown Uralian people. J. K. Bese found that the Karatchai and Bizinghi, Balkar tribes in the Caucasus, boasted of being Magyars, and that the ruins of a Magyar town were yet visible to the S. W. of Astrakhan. Orlay reports that a Caucasian tribe, called Ugrichi by the Russians, speak a Hungarian idiom. Csoma de Körös, who went in search of the cradle of his nation, supposed an analogy to exist between the names of Sovar, Pennavar, &c., places in India and Hungary, and found several words in the Thibetan and other tongues of middle Asia, akin in sound and sense to the Magyar; without, however, being able to solve the mystery of the original home of the race. F. Thomas (1806) derives the Magyars from the ancient Egyptians; S. Horváth from the Ionians, or rather the Jászes.—Many Hungarian writers report that their ancestors brought from Asia works written in their national 34 characters, which were suppressed at the command of Pope Sylvester II. and with the aid of Stephen I., but which were, however, taught as late as the beginning of our century in remote places among the Szeklers, and may be seen in S. Gyarmathy's grammar as well as in George Hickes's *Linguarum Veterum Septentrionalium Thesaurus* (3 vols. fol., Oxford, 1703-5), under the name of *Hunnorum litteræ*. The language is now accommodated to the Latin alphabet, and consists of 26 simple and 6 com-

pound sounds) agreeing, unless otherwise noticed, with the Italian, viz.: 8 vowels: *a* (like English *a* in what, swallow), *e*, *é* (French), *i* (also *y*), *o*, *u*, *ö* (Fr. *eu*), *ü* (Fr. *u*); 18 consonants: *b*, *d*, *f*, *g* hard, *h* (German), *j* (German), *k*, *l*, *m*, *n*, *p*, *r*, *s* (Eng. *sh*), *t*, *v* (also *w*), *z* (French), *sz* (Eng. *s*), *zs* (or *'s*, Fr. *j*); 4 compounds with *y*: *gy* (*dy*, as in *gyár*, factory, pron. *dyar*, in one syllable), *ly* (as in Fr. *fille*), *ny* (Fr. *gn*), *ty*; and 2 compound sibilants: *cs* (written also *ch*, *ts*; Eng. *teh*) and *cz* or *tz* (Eng. *ts*). With the addition of the vowels marked as long with the acute accent, as for instance *á* (long Italian *a*), *í*, *é*, *ő*, *ú*, *ü*, there are 38 sounds in all, beside *x*, which is used only in foreign names, as in Xerxes. As in Turkish and other kindred tongues, the whole mass of words and grammatical forms is divided into two groups, viz., into those of high and low sound. The former is determined by the presence of *e*, *ö*, *ü*, the latter by that of *a*, *o*, *u*, in the roots or stems; those with *é* or *i* constitute a neutral ground. All formative and relative suffixes have, therefore, a double form, in harmony with the roots to which they are attached; thus: *váll*, shoulder, *vállal*, undertakes, *vállalat*, enterprise; but *becs*, worth, *becsül*, he respects, *becsület*, respect. Whatever changes the Magyar language may have undergone under adverse circumstances, amid hostile nations, it has yet retained its essential peculiarities of phonetism, grammar, and construction. Although it contains many Slavic, Latin, German, Greek, and other foreign words, it has digested them in its own way, assimilating them otherwise than the western nations have done with the same element; thus, *schola*, *ecrea* (*candela*), Slav. *klas* (Lat. *arista*, *spica*), *hrubi*, Germ. *hoch*, *Schmir*, became *iskola*, *gyertya*, *kálász*, *gorombia*, *hegy* (mountain), *sinór*. The concurrence of harsh sounds and of consonants is as much avoided as in all the languages of central and eastern Asia. The roots remain unaltered, and most frequently bear the accent in all their derivatives.—The most peculiar feature of Hungarian grammar is its system of suffixes. In the possessive forms of nouns they are varied according to the number and person of the possessor and the number of the object, giving 12 distinct terminations, as follows: *házam*, my house, *házaim*, my houses; *házaid*, thy house, *házaid*, thy houses; *háza*, his or her house, *házai*, his or her houses; *házunk*, our house, *házaink*, our houses; *házatok*, your house, *házaitok*, your houses; *házok*, their house, *házaik*, their houses. In verbs they are made to indicate not only the voice, mood, and tense, and the person and number of the nominative, but the definiteness or indefiniteness of the object, and in one form (indicative present, 1st person singular) the person of the object, as *várlak*, I expect thee; *kérlek*, I ask thee. The following table exhibits the suffixes of the indicative present, the root being always the 3d person singular of the indefinite form, and the vowels varying, as above stated, in consonance with that of the root:

Person.		Active.		Passive.
		Definite.	Indefinite.	
Sing.	(1)	-om, -em (-öm)	-ok, -ek (-ök)	-atom, -etem
	(2)	-od, -ed (-öd)	-sz	-atol, -etel
	(3)	-ja, -i	(Root)	-atik, -etik
Plur.	(1)	-juk, -jük	-unk, -ünk	-atunk, -etünk
	(2)	-játok, -itek	-tok, -tek (-tök)	-attok, -ettek
	(3)	-ják, -ik	-nak, -nek	-atnak, -etnek

Examples: *várom*, I expect him, her, it, them, or the man; *várok*, I expect, wait; *váratom*, I am expected; *kéred*, thou askest him, &c.; *kérsz*, thou askest; *kéretel*, thou art asked; *látja*, he or she sees it; *lát*, he or she sees; *látjuk*, we see it; *látunk*, we see, &c. Other moods and tenses are formed by inserting new letters or syllables between the above suffixes and the root, or in a few cases by a change of the final vowel or consonant, and by auxiliaries; thus: *vára*, waited; *várunk*, we waited; *vártunk*, we have waited; *várnánk*, we would wait; *várandok*, I shall wait; *várjatok*, that ye wait. The auxiliaries are: *volt* or *vala*, for the pluperfect; *legyen*, for the conjunctive past; *volna*, for the optative past. The infinitive is formed by suffixing *ni* to the root, as *várni*, to expect. A combined future is formed by the infinitive with the auxiliary verb *fog*; thus, *várni fogok*, I shall wait; *várni fogom*, I shall expect it. Possession is indicated by the irregular verb *lenni*, to be; *van*, is; *vannak*, are; *volt*, was; *lesz*, will be, &c.; thus: *anyám van* (mother-my is), I have a mother; also with the mark of the dative, *nemem vannak kertem* (to-me are gardens-my, *mihí sunt horti*), I have gardens. Negation is expressed by *nem*, not; *nincs*, is not, *nincsenek*, are not; *sincs*, is neither. Various kinds of verbs are made by affixing certain syllables, thus: *at* or *tat*, causative; *gal*, *gat*, &c., frequentative; *dúl*, inceptive; inserting *n*, diminutive; *hat*, potential; *it*, *int*, &c., transitive; *kodik*, reciprocal, *odik*, *kozik*, reflexive, &c. Examples: *ver*, he beats; *veret*, he causes to beat; *vereket* (*verdes*, *verdegél*), he beats often; *verint*, beats softly; *verekedik*, fights with; *verődik*, beats against; *vergődik*, beats himself (breaks) through; *verhet*, can beat; *verethet*, can cause to beat; *verinhet*, can beat gently; *verekedhetik*, can fight with somebody; *verődhetik*, can knock against; *vergődhetik*, can break through, &c. All these and similar derivatives can be conjugated throughout in the same way as the simple verb. There are beside these other compounds with prefixes: *alá*, down; *átal*, through, by; *be*, in; *bele*, into; *el*, of, away; *ellen*, against; *fel*, up; *ki*, out; *össze*, together, &c.; and especially *meg*, which is an emphatic particle denoting attainment of the aim, accomplishment (like the German *er* and *be* in *erlangen*, *begraben*).—There is no gender; he and she are expressed by the same word. The definite article *az* or *a* is of recent use. The adjective precedes the substantive, and receives the marks of relations only when standing by itself. The relations called cases and those expressed by prepositions in Indo-European languages are denoted in all Altaic tongues by suffixes. The plu-

ral is formed by *k*. Cases: *é*, genitive; *nak*, genitive and dative; *t*, *at*, accusative; *ban*, in; *ba*, into; *ból*, out of; *ért*, for; *hoz*, to; *ig*, till; *ként*, like, instead, as; *kép*, in manner of; *kor*, at the time of (about); *nál* (Latin *apud*, German *bei*), at; *on*, upon; *ról*, down; *ül*, instead, as; *vá* (changed) into; *val*, with, &c., by being harmonized with the stem. Examples: *szemeinkben*, eyes-our-in; *évédeikkor*, dinners-their-at-the-time-of. The separable postpositions are of three categories: 1, answering to three questions, where? whither? whence? thus: *előtt*, before (where?); *elő*, before (whither?); *elől*, from before; such are *alatt*, below; *körött*, around; *között*, between, among; *megett*, behind; *mellett*, near by; 2, of two forms, as *hegyett*, *hegyé*, upon, &c.; 3, of one form, as *ellen*, against; *iránt*, regarding, &c. The comparative degree is formed by suffixing *bb*; the superlative by prefixing *leg* to the comparative; thus: *nagy*, great, *nagyobb*, greater, *legnagyobb*, greatest.—Pronouns: 1st person, *én*, I; *enyém*, mine; *nekem*, to me; *engemet*, me; *mí*, we; *miénk*, ours; *nekünk*, to us; *minket*, us; 2d person, *te*, *tiéd*, *neked*, *tegedet*; *ti*, *tiétek*, *nektek*, *tiéteket*; 3d person, of both genders, *ő*, *őre*, *neki*, *öt*; *ők*, *övék*, *nekik*, *öket*. These are joined with relative prefixes, thus: *benne*, in me; *béltől*, out of thee; *hozzád*, to them; *alattam*, under me; *alattad*, under thee, &c. In addressing a person we say *ön*, plural *önök*, or *kegyed*, plural *kegyetek*, for both genders; or *az úr*, sir (the lord or gentleman); *urasságod*, sirship-thy; *az asszony*, lady; *asszonyságod*, ladyship-thy; formerly *maga*, self; to persons of lower standing, *kend*, you.—Numerals: *egy*, 1; *kettő*, *két*, 2; *három*, 3; *négy*, 4; *öt*, 5; *hat*, 6; *hét*, 7; *nyolcz*, 8; *kilencz*, 9; *tíz*, 10; *tizenegy*, 11, &c.; *húsz*, 20; *harmincz*, 30; *negyven*, 40, &c.; *száz*, 100; *ezer*, 1000. Ordinals: *első*, 1st; *második*, 2d; the others are formed by suffixing *dik*, as *negyedik*, *századik*, &c. All other varieties are formed by suitable suffixes.—The formation of parts of speech, and of various categories of signification, is extremely luxuriant by means of suffixed letters or syllables, so that an indefinite and yet ever intelligible mass of words may be made to suit all conceptions and shades of meaning. This plasticity of the Magyar, together with its free syntax, renders it capable of expressing the turns of other tongues and the Greek and Latin metres with more ease and fidelity than almost any other language. We subjoin an example of construction and of elegiac distichs:

Férfiak! így szólott Pannón vérszeme hajdan:
Men! so spake Pannonia's war-god (its) of old:

Boldog földet adok, víjtoké érte ha kell,
Blessed country give-I, fight-ye for-it if need,

'S víttanak elszántán nagy bátor nemzetek érte
and fought decidedly great brave nations for-it

'S véresen a diadalt végre kinyerte magyar.
and bloodily the victory lastly gained (the) Hungarian.

Ah de víszády maradtott a népek' lelkein: a föld
alas but discord remained the nations' souls-in: the land

Boldogga nem tud lenni az átok alatt
happy-made not knows (can) be the curse under.
(Vörösmarty.)

—This language is spoken by more than $\frac{1}{4}$ of the population of Hungary in its wider sense, by more than $\frac{1}{2}$ of that of Transylvania, and in some places of Moldavia, Wallachia, and Bukovina. It consists of four dialects, which do not differ so much as those of other tongues, viz.: the Gyori, of Raab or Trans-Danubian, and the Bihari on the Theiss, both represented in books; the Palócz in the Mátra mountains, in the contiguous districts of the counties of Heves, Borsod, Gömör, Hont, and Nógrád, with more genuine ancient Magyar words than the preceding; and the Székely in Transylvania and the contiguous countries, with many Tartaric words, and of a drawling pronunciation. The language has varied very little in progress of time.—HUNGARIAN LITERATURE is comparatively of late date. The introduction of the religion of Rome under King Stephen I. (997–1038) made the Latin, the language of its priests and teachers, predominant in the court, the higher institutions for education, administration, and justice, and among the higher classes in general, which found it the most convenient medium for communication with the representatives of the cultivated West and South in diplomacy, literature, or religion. Of the time of the Árpáds and the next following period only Latin chronicles are preserved, of which those of the “Anonymous Secretary of King Béla” (II.) and Simon Kézai, the *Chronicon Budense*, and the *Chronicon Lerum Hungaricarum* of John Turóczi (Thurocius), are the most remarkable. The court of Matthias Corvinus (1458–90) at Buda was adorned by some distinguished native and foreign scholars of that age. Of the latter, Bonfinius wrote an interesting though often legendary history of Hungary in *Decades IV.*, which was published with a continuation by Sambucus (Basel, 1568). Galeotus wrote on Matthias himself, whose librarian he was, and Callimachus on Attila and Uladislas I. Among the natives the poet Janus Pannonius holds the foremost rank. The preserved remnants of Hungarian writings of that period are very scanty. The spread of the reformation in the following century, as in most countries of Europe, promoted the culture of the native tongue. But the simultaneous disasters of the country, the Turkish and civil wars, and chiefly the introduction of the German element with the dynasty of the Hapsburgs, checked the development of a flourishing national literature. Parts of the Scriptures were translated into Hungarian during the 16th century by Komjáti, Erdősi, Heltai, Székely, Juhász, Károlyi, and others. Gál, Juhász, Kulcsár, Telegdi, Décsi, Károlyi, and others distinguished themselves as orators. Tinódi, Valkai, Temesvári, and others sang the warlike exploits of their times in light verses, Kákonyi the deeds of Cyrus, Csáktornyai the heroes of the siege of Troy; Balassa, Rimai, and Erdősi composed lyrical poems of incomparably higher merit. In the 17th century the Hungarian muse found votaries in Zrinyi, the grandson of the defender of Sziget, who celebrated in rhymed alexan-

drines the deeds and death of that hero, in Liszti, Paskó, and Koháry, and especially in Gyöngyösi, who sang the defence of Murány by Maria Szécsi. Molnár and Káldi translated the Scriptures; the primate and cardinal Pázmán and Keeskeméti were distinguished as orators; Csere even published a cyclopædia of sciences and a treatise on logic in Hungarian. This national movement in literature was paralyzed by the growing influence of the German dynasty; the bloody persecutions of the patriots under Leopold I. (1657-1705) suppressed it almost entirely. The Latin again became prominent, being cultivated in the 18th century by a large number of scholars in every branch, who vied with each other in the purity of their dead idiom, and compared with whom the Hungarian writers Faludi and Bessenyei, the founders of a classical and a French school in poetry, Orczy, Count Teleky, Baróczy, Révay, and others, formed but a feeble minority. A new and fertile period began about the close of the last century, chiefly in consequence of the despotic measures of Joseph II. (1780-90) for the Germanization of the country, which caused a lively and general reaction. Societies for the cultivation of the national tongue were formed, literary, political, and scientific periodicals started, national theatres established, and various linguistic theories developed. This movement, being identical with the general regeneration of the nation, and enthusiastically promoted by the foremost statesmen and orators of the country, became triumphant over all foreign elements after the first quarter of the present century, about the beginning of which Francis Kazinczy, the great reformer of the language after Révay, and the popular poet Csokonai, appear as the foremost in literature. The poets Dayka, Verseghy, and Virág, and the novelist Dugonics, were their contemporaries. The lyrical "Loves of Himfy" (*Himfy szerelmei*), by Alexander Kisfaludy (1801), were received with general admiration, and were followed by his "Tales" (*Regék*) and other poems. Berzsenyi wrote glowing odes in Roman metre. The poets Andrew Horváth, Döbrentei, Vitkovics, Kis, and Paul Szemere, belong both to the period of regeneration and to the golden age of Hungarian literature, which embraces the 30 years preceding the revolution of 1848-49. This period opens with the simultaneous activity of 5 classical writers, Charles Kisfaludy, the brother of Alexander, Kölcsey, Fáy, Czuczor, and Vörösmarty, of whom only the last 3 survived it. Kisfaludy may be regarded as the creator of the Hungarian drama by his tragedies, and still more by his really national comedies, some of which are as yet unsurpassed. Kölcsey's lyrical poems, ballads, and prose writings, including orations, are distinguished by a spirit of ardent patriotism and philosophical philanthropy, as well as by a rare precision and harmony of diction. Fáy's "Fables" (*Mesék*) are excellent specimens of that kind of poetry, in the manner of Lessing. Czuczor, distinguished

also as a grammarian and lexicographer, is chiefly renowned for his popular songs and his historical epics in hexameter, the "Battle of Angsburg" (*Angsburgi ütközet*) and "Assembly of Arad" (*Aradi gyűlés*). The latter, however, were excelled by the more numerous epics of Vörösmarty, "Cserhalom," "The Flight of Zalán" (*Zalán futása*), "Erlau" (*Eger*), &c., which, together with his tragedies, short novels, songs, and especially odes and ballads, gave him the foremost rank among the writers of his nation. In lyrical poetry, next to Vörösmarty and Kölcsey we find Bajza, who is also remarkable as an æsthetic critic and historical writer, Peter Vajda, John Erdélyi, Kunoss, Alexander Vachott, Császár, and especially Garay, whose ballads also rival those of Vörösmarty. Toward the close of the period appear the three youthful popular poets Tompa, Arany, and Petöfi, of whom the first two excelled chiefly in tales and legends, and the last in light and playful songs, whose subjects are love, liberty, independence, nature, and all that can touch the heart or inspire imagination. Fictitious literature was chiefly cultivated, if not created, by Jósika, whose historical novels, "Abafi," "The Last of the Báthoris" (*Utolsó Báthory*), "The Bohemians in Hungary" (*Csehek Magyarországon*), &c., exercised the greatest influence upon the development of Hungarian prose after Kazinczy. Smaller though not inferior works were written by Peter Vajda. In many respects both were surpassed by Eötvös, whose "Cartluisian" (*A earlhausi*), a philosophical romance, "Village Notary" (*A falu jegyzője*), an admirable picture of recent political life in Hungary, and "Hungary in 1514" (*Magyarország 1514ben*), a historical novel, place him among the most eminent writers of his age. Kutly is often eminent in pictures of nature, and Ignatius Nagy in caricaturing characters; both produced imitations of Sue's "Mysteries," taken from Hungarian life, but disfigured by unnatural exaggerations. Kemény and Jókai belong also to a more recent period. The principal dramatic authors beside Kisfaludy and Vörösmarty were Katona (*Bánk Bán*), Laurentius Tóth, Garay, Szigligeti, who is eminent in popular plays, Gál ("The Notary of Peleske"), I. Nagy, Emeric Vahot, Paul Kovács, and Csakó. Travels were written by Belenyei (America), Császár (Italy); Bartholomew Szemere, Irinyi, L. Tóth, and Gorove (western Europe); Méhes (Switzerland), Jerney (south-eastern Europe), and Reguly (northern Russia), the work of Szemere being one of the most remarkable productions of the period; political works by Széchenyi, Weszelényi, Kossuth, Eötvös, Szalay, B. Szemere, and others; the best histories by M. Horváth, Péczely, and Jászay (Hungary), Bajza (ancient world), and Toldy (national literature); philosophical treatises by Szontágh, Márki, Gregus, and others; the best statistical works by Fényes, Vállas, and Kőváry. Natural sciences, theology, languages, and antiquities also found numerous representatives. The best grammatical and lex-

icographical works on the national language were written by Czuczor, Fogarassy, and Bloch. The beautiful songs of the people were published in various collections, among others by Erdélyi; miscellaneous writings by Pulszky, Lukács, Frankenburg, Gabriel Kazinczy, Gondol, Berecz, Pompéry, Amélia Bezerédy, Theresa Karacs, and others. Of translators we will mention only Szabó, who published an admirable metrical version of Homer. During the revolution of 1848-'9 the muses were silent, excepting only the stirring songs of war. The battle field closed many a glorious career, as in the case of Petőfi, and destroyed many an incipient genius, as in that of the eloquent Vasvári. After the close of the war the dungeon, the scaffold, and exile doomed the most gifted of the nation to silence. The last 12 years are therefore in a literary respect far behind the preceding period, although the unabated enthusiasm of the people for the preservation of their only remaining national treasure, the language, has given rise to a large number of productions of different degrees of merit. Some of them, mostly belonging to the surviving representatives of the preceding period, are worthy of their great popularity. In poetry the imitators of Petőfi have been numerous. Among the most remarkable publications of the last 12 years are the poems of Tompa, Arany, Sárosy, Lisznyai, Lévai, Gyulai, Nicholas Szemere, Szász, Jámor (Hiador), Sükei, Szelestei, Bozzai, Losonezy, Székely, and others; the novels of Kemény, Jósika, Jókai, Pálffy, Gyulai, and Béreczy; the humorous writings of Bernát and Radakovics (Vas Gereben); the historical works of Szalay, Josephi Teleky, Jászay, Toldy, Csengery, Palugyai, Mészáros, Fejér, Hunfalvy, &c.; the political writings of Eötvös and Kemény; the translations of Stephen and Charles Szabó, Hunfalvy, Csengery, Irinyi, Szász, and Sükei; the travels of Andrassy (India), Nendtwich (America), Podmaniczky (northern Europe), Magyar (southern Africa), &c.; the dramas of Szigligeti and others. Journalism and oratory, both of which had attained their highest development during the later period of Kossuth's agitation, have comparatively suffered the most noticeable decay through the complete extinction of the liberty of the press and speech, after the revolution. This sketch, which includes various Magyar productions of the Transylvanian press, excludes all more modern non-Magyar literary productions of Hungary belonging to the Slavic, German, Wallachian, or other literatures, as well as those of the Hungarian exiles (Mr. and Mrs. Pulszky, Ludvig, Szarvady, &c.) in foreign languages.—Among the principal works on Hungarian history (in various languages) are those of Bel, Pray, Gebhardi, Katona, Fessler, Engel, Majláth, Horváth, Péczely, Toldy, A. de Gérando, and Szalay; on the last revolution, the memoirs or sketches of Klapka, Görgey, Czecc, Szemere, Schlesinger, Horn, Szabad, and Irányi and Chassin.

HUNGER, the sensation by which the necessity for food is made known to the system, re-

ferred to the stomach, but indicating the wants of the system at large; impelling us to supply the waste of the tissues consequent on all vital acts, and in proportion to the activity of the animal functions from exercise, &c. If the desire cannot be gratified, or if absent from disease, the phenomena of inanition or of starvation are induced, with a diminution of the bulk of nearly all the tissues and proportionate weakness. Hunger is greatest in the young and growing state, and least in old age, when the vital operations are deficient in activity. It varies with the amount of heat to be generated in the body; external cold increases hunger, while heat diminishes it; hence the voracious appetite of the arctic regions, and the general use of stimulating condiments in the tropics; it is also increased by any unusual drain upon the system, as in profuse suppuration, lactation, and diabetes, in the last of which especially hunger is almost insatiable. In health, the feeling of hunger is a very good indication of the demands of the system for food, and it becomes the stimulant to mental operations, automatic in infancy, but directed by intelligence in the adult, which have for their object the gratification of the desire. Hunger depends rather upon the demand of the system for aliment than upon the state of emptiness of the stomach. The sense of hunger may be, however, immediately dependent on some condition of the stomach; it is well known that the swallowing of indigestible and non-nutritious substances will temporarily relieve it. The wants of the general system in this respect are probably communicated to the sensorium by the pneumogastric nerves and to the stomach by the sympathetic; through the latter the capillary circulation and the gastric secretion are excited, the latter relieving the former, which is believed by Carpenter to be the proximate cause of hunger by its action on the nervous centres; the act of secretion unloads the vessels, and relieves the hunger for the time, but if the food do not supply the wants of the system, the feeling of hunger returns with increased intensity. On the other hand, mere emptiness of the stomach does not produce hunger, as is evident from the fact that an ample supply of food passes entirely from the stomach hours before this sensation is felt, and that in disease there may be no desire for food for many days with total abstinence from it. The stomach may be full of food, and, if the products of digestion cannot pass from it because of pyloric or other obstruction, the sense of hunger is not appeased; moreover, hunger may be relieved by the injection of alimentary fluids into the large intestine, in cases where the stomach cannot receive or retain food.

HUNS (Lat. *Hunni*), a people of northern Asia who in the 5th century invaded and conquered a great part of Europe. Of their origin little is known with certainty. Under the name of Chuni they were known to the Greeks, and are mentioned by Ptolemy as early as the 2d

century. According to the theory of De Guignes in his *Histoire des Huns*, a theory now not entertained, however, by competent critics, the Huns were a Tartar nation, the Hionng-nou, whose original country was the region immediately north of the great wall of China, which was built to protect that empire against their incursions. For several ages they carried on successful wars against the Chinese emperors, who were compelled to pay them tribute in order to purchase a precarious peace. Their power was at length broken by the arms of the emperor Vouti and by their own dissensions, and in the first century of the Christian era the unconquered remnant of the nation abandoned their country and marched westward in search of a new home. The course of their emigration soon carried them beyond the limits of the Chinese monarchy into the region watered by the Oxus. One division established themselves in the fertile and extensive plains on the E. side of the Caspian sea, where in time their manners became softened and their features changed by the mildness of the climate and by mixture with the nations around them, so that they became known as white Huns. The main body of the nation advanced toward the north-west, and established themselves for a while in Russia on the banks of the Volga. In the 3d century they crossed the Volga with their flocks and herds and families, and invaded the territory of the Alani, a barbarous nation, whom they conquered and amalgamated with themselves. The united nations pressed onward, and attacked the Goths in 376 B. C. The Goths were defeated, their king Hermanric put to death, and the Gothic nation driven to seek an asylum within the bounds of the Roman empire. The Huns established themselves on the banks of the Don and the Dnieper in Pannonia. They soon became involved in war with the Romans, and in the 5th century under the leadership of Attila attained to a high degree of power and empire. (See ATTILA.) Their dominion fell to pieces after the death of Attila (453), and the people themselves were lost and swallowed up in fresh invasions of barbarians from the north and east. According to some writers, the Huns were a tribe of Finnish stock, and the ancestors of the Hungarians or Magyars. They are described by the Roman writers as hideous in appearance, with broad shoulders, flat noses, and small black eyes, deeply buried in the head. "A fabulous origin was assigned to them," says Gibbon, "worthy of their form and manners: that the witches of Scythia, who for their foul and deadly practices had been driven from society, had copulated in the desert with infernal spirits; and that the Huns were the offspring of this execrable conjunction. The tale, so full of horror and absurdity, was greedily embraced by the credulous terror of the Goths; but, while it gratified their hatred, it increased their fear, since the posterity of demons and witches might be supposed to inherit some share of the

preternatural powers as well as of the malignant temper of their parents."—See *Histoire générale des Huns, Turcs, Mogols et autres Tartares occidentaux*, by Joseph de Guignes (5 vols. 4to., Paris, 1756-8).

HUNT, a N. E. co. of Texas, drained by tributaries of Red and Sabine rivers; area, 935 sq. m.; pop. in 1858, 4,963, of whom 359 were slaves. It has a rolling and in some places hilly surface, and is well wooded with oak, elm, ash, and other timber. The soil is black and very fertile. The productions in 1850 were 19,520 bushels of Indian corn, 4,023 of sweet potatoes, and 8,420 lbs. of butter. Wheat is now successfully cultivated. Value of real estate in 1858, \$493,075. Capital, Greenville.

HUNT, FREEMAN, an American author and journalist, born in Quincy, Mass., in 1804, died in New York, March 2, 1858. He commenced his literary career in Boston, where he established the "Ladies' Magazine," the "Weekly Traveller," and the "Juvenile Miscellany," and in 1830 published "Anecdotes and Sketches illustrative of Female Character, Original and Selected" (2 vols. 12mo.). Removing in 1831 to New York, he established there a periodical entitled the "Traveller," which was the vehicle for the publication of many interesting sketches by himself, a series of which subsequently appeared under the title of "Letters about the Hudson and its Vicinity." In July, 1839, appeared the first number of the "Merchants' Magazine," a monthly magazine which he organized chiefly in the interest of the mercantile classes, and of which he remained proprietor and conductor until his death. From the outset it was conducted with ability, and the 38 volumes edited by him constitute a valuable repository of commercial, agricultural, and other statistics. In 1845 he published the first volume of the "Library of Commerce," and in 1856-7 the "Lives of American Merchants" (2 vols. 8vo.). His last work was entitled "Wealth and Worth, a collection of Morals, Maxims, and Miscellanies for Merchants."

HUNT, HENRY, an English radical politician, born in Upavon, Wiltshire, Nov. 6, 1773, died in Alresford, Hants, Feb. 12, 1835. He was a wealthy farmer, and in early life was noted for extreme loyalty, having in 1801, during the alarm at the projected French invasion, offered to place his property, valued at £20,000, at the disposal of government. He subsequently retired in disgust from the Every troop of yeomanry on account of their refusal to volunteer their services out of the county, and joined the Marlborough troop. Having challenged his commander, Lord Bruce, he was tried and sentenced to pay a fine of £100, and to be imprisoned for 6 weeks in the king's bench. During his confinement he was visited by several prominent reformers, under whose influence he became a fearless champion of the most radical section of the party, and the political associate of Sir Francis Burdett, Horne Tooke, and William Cobbett. For many years he attempted to

secure a seat in parliament, contesting unsuccessfully Bristol, Westminster, and Somersetshire, and addressing popular meetings in the large manufacturing towns and in other parts of the kingdom. In Aug. 1819, he presided over the reform meeting in Manchester, which for alleged illegality was dispersed by the military, after 11 persons had been killed and upward of 600 wounded; and for his participation in this affair an indictment for conspiracy was found against him. Previous to the trial he was honored with a public reception in London, at which it is said a greater concourse of people was collected than had ever before been assembled in England. He was sentenced to 2½ years' confinement in Ilchester gaol, and after his release made another public entry into London on Nov. 11, 1822. In 1830 and 1831 he was returned to the house of commons from Preston; but failing of an election to the next parliament, he made the tour of England in a handsome equipage, speaking in the principal towns, and offering for sale, under the name of "radical coffee," roasted grains of wheat, as a substitute for the heavily taxed coffee of the West and East Indies. Subsequently he made his appearance in London in a coach drawn by white horses, from which he sold a new kind of blacking invented by himself. He died of a stroke of paralysis while on one of his progresses through the kingdom.

HUNT, JAMES HENRY LEIGH, an English poet and essayist, born in Southgate, Middlesex, Oct. 19, 1784, died there, Aug. 28, 1859. His father, a West Indian by birth, married an American lady, a native of Philadelphia, and at the commencement of the American revolution was established in that city in the practice of the law. Having warmly espoused the cause of the crown, he was obliged to leave the country, and settled in England, where he took orders, and for some time officiated as tutor to Mr. Leigh, the nephew of the duke of Chandos, from whom the subject of this notice was named. Leigh Hunt was educated at Christ's hospital, London, where he remained until his 15th year, at which time he was first deputy Grecian. As this position, however, involved the necessity of delivering a speech in public, and of entering the church, he left the school, and after remaining some time in the office of his brother, who was an attorney, procured a situation in the war office. At this early age he was a prolific writer of verses, a collection of which was published by his father in 1801 under the title of "Juvenilia, or a Collection of Poems written between the Ages of 12 and 16" (12mo., London). The author in later life characterized these juvenile performances as "a heap of imitations, all but absolutely worthless." About this time he began also to contribute to the periodicals, and subsequent to 1805 he furnished theatrical criticisms and literary articles to the "News," a Sunday paper established in that year by his brother John, and of which he became a sort of co-editor. A selection from his theatrical articles was pub-

lished in 1807 under the title of "Critical Essays on the Performances at the London Theatres" (12mo., London). Leaving the war office in 1808, he established in conjunction with his brother the "Examiner," a newspaper, which under the editorship of the Hunts attained considerable popularity for its liberal politics and the high standard of its literary articles, and which is still one of the leading weekly journals of England. At that period of tory ascendancy, the boldness with which the editors discussed public measures did not fail to subject them to persecution, and on three several occasions the "Examiner" was prosecuted by government. On the first occasion, the offence being certain reflections on the rule of George III., the prosecution was abandoned; on the second, for an article against the practice of flogging in the navy, the Hunts were tried before Lord Ellenborough, but, being defended by Brougham, were acquitted; and on the third, for calling the prince regent "an Adonis of 50," they were sentenced to pay a fine of £500 each, and to suffer two years' imprisonment from Dec. 9, 1812. The latter penalty was endured by Leigh Hunt in a manner which converted punishment into a pleasure. By his own taste and the attentions of his friends, his prison cell was transformed into an elegant apartment, adorned with bookcases, busts, and flowers, and so far deprived of its original appearance that Charles Lamb declared there was no other such room except in a fairy tale. A small yard upon which the cell opened in like manner became a garden with grass plots, flower beds, and shade and fruit trees, where in fine weather he was accustomed to read and write. His captivity was cheered by visits from Byron, Moore, Charles Lamb, Hazlitt, Shelley, Keats, and others, with several of whom he then became acquainted for the first time; and so agreeable did his life prove that he found little reason to regret having rejected the offer of the government not to press the penalties if he would engage that no similar articles should thereafter appear in the "Examiner." Upon leaving prison, an event commemorated by Keats in one of his finest sonnets, he published several works prepared during his confinement, including the "Feast of the Poets," &c. (8vo., London, 1814), the "Descent of Liberty, a Mask" (12mo., 1815), and "The Story of Rimini" (8vo., 1816), his longest and best poem; and he continued as before to conduct the "Examiner." In 1818 appeared "Foliage," a mélange of original poems and translations from Homer, Theocritus, Bion, &c.; and in 1819 he started the "Indicator," a small weekly journal on the model of Addison's "Spectator," which was for two years the vehicle of some of his most characteristic essays, and which was followed in 1822 by the "Indicator and Companion (Selections)" (2 vols. 8vo.). His reputation as a writer of prose and poetry was now at its height, notwithstanding the attacks of the tory press and the fierce ridicule directed against the

school of poetry of which his "Rimini" was an exemplar, and which was sneeringly called the "Cockney school." But his pecuniary resources had been so seriously affected by his imprisonment and by the expenses of the suits brought against him, that he gladly accepted an invitation from Byron and Shelley to visit Pisa, and assist them in conducting the "Liberal," a journal intended to represent ultra liberal opinions in literature and politics—a literary partnership jeeringly called by "Blackwood" the "holy alliance of Pisa." He arrived in Italy in June, 1822, and within a few days after meeting Shelley witnessed the obsequies of his friend on the shore of the bay of Spezia. He subsequently resided for some months with Byron, but the union, without the coöperation of Shelley, was not of a kind to be permanent. Byron's aristocratic friends ridiculed the plebeian connection he had formed; the journal proved unsuccessful, and the poets parted with feelings anything but friendly. After Byron's death it was found that in his presentation copy of "Rimini" he had erased the words, "My dear Byron," with which Hunt had commenced the dedication, and had written on the opposite margin: "Impudent varlet." Hunt continued for several years to reside in Italy with his family, and after his return to England published his "Recollections of Lord Byron and some of his Contemporaries," &c. (4to. and 2 vols. 8vo., 1828), a work which excited severe strictures from Byron's friends, who accused Hunt of ingratitude, although the latter had merely given vent to his disappointed feelings with a harshness which he subsequently acknowledged was unjust. From that time forward his life was steadily devoted to literature, in the pursuit of which he was obliged to struggle with influences foreign to his nature and poetical temperament, and to experience various mutations of fortune. He was not of that practical turn which would have fitted him to battle successfully with the world, and until 1847, when he received from the crown a literary pension of £200, he was frequently involved in pecuniary difficulties. Amid all kinds of reverses, however, he preserved his cheerfulness and equanimity. Among his remaining literary productions were: a prose romance, entitled "Sir Ralph Esher" (3 vols., 1832); "Captain Sword and Captain Pen" (1839), a metrical satire denouncing war; the "Legend of Florence" (1840), a play produced with some success at Covent Garden theatre; the "Seer" (1840-'41), a collection of essays; the "Palfrey" (1842), a love story in rhyme; "Stories from the Italian Poets, with Lives of the Writers" (2 vols., 1846), a charming collection of translations; "Men, Women, and Books" (2 vols., 1847), a selection from his uncollected prose writings; the "Town" (2 vols., 1848), which with the "Old Court Suburb" (2 vols., 1855) is made up of metropolitan tradition and anecdote; his "Autobiography" (3 vols., 1850); "Table Talk, with Imaginary Conversations of Pope and Swift" (12mo., 1850);

"Religion of the Heart" (1853), &c. In addition to these, he edited "Imagination and Fancy" (8vo., 1844) and "Wit and Humor" (1846), containing selections from the English poets; "A Jar of Honey from Mt. Hybla" (1847); "A Book for a Corner" (2 vols. 12mo., 1849), &c.; and was at different times editor of the "Tatler," the "London Journal," &c., and a contributor to many leading reviews and magazines. Among his numerous translations may be mentioned Tasso's *Aminta*, Redi's *Bacco in Toscana*, and Boileau's *Lutrin*. To dramatic literature he has furnished editions of Congreve, Wycherly, Vanbrugh and Farquhar, of Sheridan, and of Beaumont and Fletcher, the latter pruned of all passages "morally objectionable." He was also a contributor to "Household Words," and up to within a few weeks of his death wrote an occasional article for the "Spectator" newspaper. His rank as a poet was established by the publication of "Rimini," which exhibits his sparkling and lively fancy, the affluence of his imagination, and his felicity in word painting; and at the same time also those affectations, and quaint, far-fetched conceits, which characterize all his poetry, and which at the outset subjected him to the ridicule of Tory critics. His models were clearly Italian, and his translations from the Italian poets are pronounced by Miss Mitford "some of the very best since Cowley." Many of the qualities of his poetry pervade his prose writings, and his collections of essays have gained a wide popularity by their genial and colloquial tone, the graceful fancies with which they are interspersed, and the learning, taste, and refinement which they reveal. Of this class of his works Hazlitt says: "Many of his effusions in the 'Indicator' show that he inherits more of the spirit of Steele than any man of his time." As a political writer he was forcible, just, and considerate, and in the expression of his liberal opinions utterly without fear. During the last year of his life he was collecting a complete and final edition of his poetical works, of which the greater portion received a finishing touch only a month previous to his death. In the United States, where his works are well known, an edition of his poems, collected and arranged by himself, appeared in Boston in 1857 (2 vols. 32mo.), and in the same year an edition of his works was published in New York (4 vols. 12mo.).—THORNTON, an English journalist, eldest son of the preceding, born in London, Sept. 10, 1810. He was educated to be a painter, a profession which he resigned to enter upon the career of an author. Commencing as an art critic, he was subsequently successively employed as co-editor on several provincial newspapers, and in 1840 established himself in London, where he has since been permanently connected with the newspaper press. As a political writer he has been an earnest supporter of the British constitution, and an advocate of an extended franchise. With the exception of a few pamphlets, he has published but one work

under his own name, the "Foster Brother" (3 vols. 8vo., 1845), a historical romance of the 14th century. He has recently finished for the press a complete edition of his father's poetical works, in the preparation of which the latter was engaged at the time of his death.

HUNT, THOMAS STERRY, an American chemist, mineralogist, and geologist, born in Norwich, Conn., Sept. 5, 1826. His early education was obtained at the academy and grammar school of his native town. He studied for a while with a view to the medical profession, but was subsequently induced to devote himself to chemistry, and accordingly in 1845 became a private student with Prof. B. Silliman, jr., in Yale college, where also he was subsequently chemical assistant to Prof. Silliman senior. During his medical studies in Norwich, being unprovided with any means for the pursuit of chemical research beyond the humble resources of a country apothecary's shop, he undertook the analysis of monazite, a very rare mineral found there, and of an intricate constitution, containing metallic oxides then almost unknown. This difficult problem he so far mastered as to make known the composition of the mineral with tolerable accuracy. After two years' study in the Yale laboratory he was offered by the late Prof. James F. W. Johnston the post of chemical assistant in his then newly established school of agricultural chemistry in Edinburgh; but he declined this overture in order to accept the post of chemist and mineralogist to the geological commission for the survey of Canada, still in progress under the direction of Sir W. E. Logan. He had been previously named also to the same post in the geological survey of Vermont, then in progress, which he declined. His labors in the Canadian survey have contributed greatly to advance our knowledge both of the scientific and economical geology of Canada. His earlier studies were especially directed to organic chemistry, then assuming shape from the labors of Liebig, Dumas, Laurent, and Gerhardt. It was as the reviewer, interpreter, and critic of these chemists that Mr. Hunt first became known. Boldly attacking the views of the rival schools of Giessen and Montpellier, he developed from the germs contained in some of the papers of Laurent a system which may be said to be essentially his own. In this system he deduces all chemical compounds, organic and inorganic, from simple types, which were represented by one or more atoms of water or hydrogen. These bold views he maintained at first single-handed in a series of papers which appeared in successive volumes of the "American Journal of Science" from 1848 to 1851; but they were at length accepted by Williamson and Brodie in England, by Wurtz in Paris, and at last by Gerhardt himself. This happy conception of Mr. Hunt will rank in the history of the science with the compound radical theory of Liebig and the law of homologous series of Gerhardt. The author has now the satisfaction of seeing it generally received, although it is

often erroneously attributed to the chemists last named, who were, however, led by Mr. Hunt some 2 or 3 years, and who historically are his followers. Mr. Hunt's philosophical views in chemistry and physics have plainly been influenced by the study of Kant, and still more of Hegel and Stallo. This may be seen in his essays on "Solution," "Chemical Changes," and "Atomic Volumes," which appeared first in the "American Journal," but were republished in England and Germany. In these he attacks the long established atomic hypothesis and all its consequences, and asserts that chemical union is interpenetration, or rather identification. His researches upon the atomic volume of liquids and solids were a remarkable anticipation of those of Dumas; while by his views on the polymerism of mineral species he has opened a new and as yet unexplored field for mineralogy. These philosophical studies have however been only incidental to Mr. Hunt's more serious labors of research in chemical mineralogy and chemical geology. These researches, still in progress, on the sedimentary rocks of Canada and her mineral waters, have already contributed essentially toward obtaining more just views of chemical geology, and a more rational theory of rock metamorphism, while serving to elucidate the rocks of Canada in aid of the researches of Sir W. E. Logan in the stratigraphical geology of that country. Thus the analyses and chemical researches of Mr. Hunt have demonstrated that the wide-spread alteration and crystallization of the sedimentary rocks, constituting what is known as normal metamorphism, have been produced by the intervention of alkaline waters, and his conclusions were speedily confirmed by the recent experiments of Daubrée. In some of his more recent papers Mr. Hunt has discussed the theory of igneous rocks and of volcanic phenomena from a new point of view, and has in a forcible manner revived the almost forgotten views of Herschel and Keferstein, who place the seat and source of all these in the sedimentary deposits of the earth's crust. He undertakes to show that the chemical reactions established in these sediments by the ascending heat of the earth's nucleus will explain all volcanic and Plutonic phenomena. He has further discussed the chemical conditions of a cooling globe such as the primal earth is assumed to have been, and essays to show how the present chemical conditions of the sea, the atmosphere, and the solid rocks have been produced by the slow operation of natural causes. In his lately published researches on the formation of gypsum and magneesian rocks ("Journal of Science," [2] xxviii.) he has, by the discovery of new and most important reactions of the salts of lime and magnesia, been able to resolve in a rational way the hitherto knotty problem of the formation of these rocks, and refute the ordinary hypothesis of their origin. His memoirs on the serpentines or ophiolites, and on euphotide and serpentine, among others, in chemical lithology, are notice-

able for laborious and successful research. Beside the contributions of Mr. Hunt to the "American Journal of Science" and to the London "Philosophical Magazine," the royal society, the French academy of sciences, &c., we may cite his share in the reports of the geological survey of Canada for the last 10 years. He is also the author of a summary of organic chemistry, forming a part of Prof. Silliman's "First Principles of Chemistry." Mr. Hunt was one of the English members of the international jury at the great exhibition at Paris in 1855, when he attracted attention by his communications to the geological society of France and the French academy. At that time he was decorated by Napoleon III. with the cross of the legion of honor. In addition to his duties as a member of the geological commission of Canada, Mr. Hunt is professor of chemistry to the faculty of arts in the university of Quebec, where he lectures in French. In 1854 he received the honorary degree of A.M. from Harvard college, and in 1857 that of doctor of sciences from Quebec. He is a member of various learned bodies, and in 1859 was elected a fellow of the royal society of London. A complete list of Mr. Hunt's scientific memoirs would occupy more space than our limits permit. In the second series of the "Journal of Science" alone, he has published 71 papers since 1846.

HUNT, WILLIAM, an English water-color painter, born in London in 1790. He became a member of the old society of painters in water colors in 1824, and since that time has pretty regularly contributed to their annual exhibitions. As a colorist he ranks among the first painters of the day.

HUNT, WILLIAM HOLMAN, an English painter, born in London in 1827. He studied in the school of the royal academy, and in 1846 exhibited his first picture, entitled "Hark," which was followed by a scene from "Woodstock" (1847), the "Flight of Madeline and Porphyro," from Keats's "Eve of St. Agnes" (1848), and "Rienzi vowing to obtain Justice for the Murder of his Brother," from Bulwer's novel (1849). In 1850 appeared his "Converted British Family sheltering a Christian Missionary from the Persecution of the Druids," the first fruits of the new "pre-Raphaelite" movement in British art. Impressed with the insufficiency of conventional academical rules to give a true expression to the forms of nature, he had in the previous year associated himself with John Everett Millais and Dante Gabriel Rossetti, two young painters, for the purpose of restoring to the art of painting somewhat of the earnestness and conscientious accuracy that had animated the painters who preceded Raphael. Mediævalism in theology and architecture was the prevailing mode of the day, and the young artists showed the influence which it had perhaps unconsciously exerted upon them, by styling themselves the "pre-Raphaelites;" although they distinctly avowed their object to be chiefly the study of nature, to which they looked for

inspiration, and the minutest details of which they proposed to copy with scrupulous accuracy; and that they were less bent on imitating the models which Giotto or Fra Angelico had bequeathed them, than on inculcating the principles which these masters had observed. By common consent Hunt was regarded as the leader of the new school, which was shortly joined by Charles Collins and other young artists; and notwithstanding much hostile criticism and ridicule from those who refuse to recognize the object of the pre-Raphaelites, he has continued year by year to develop the idea with which he started. In 1851 appeared his "Valentine rescuing Sylvia from Proteus," in 1852 "The Hireling Shepherd," and in 1853 "Claudio and Isabella" and "Our English Coasts," a pre-Raphaelite study of the downs at Hastings, all strongly imbued with the characteristics of the new style. In 1854 he produced two powerful pictures, the "Awakened Conscience" and the "Light of the World," the latter of which, a symbolical representation of Christ appealing to the human soul, was severely handled by the critics. Both works were made the subject of two characteristic letters by John Ruskin, in which the artist's meaning was elaborately explained. A small copy of the "Light of the World" was exhibited in the collection of works by British artists brought to the United States in 1857. The summer of 1855 was spent by Mr. Hunt on the shores of the Dead sea, where he took studies of almost painful minuteness of the surrounding scenery, which were subsequently embodied in his picture of the "Scape Goat," exhibited in the succeeding year. He has since been almost exclusively engaged upon a picture of Christ disputing with the doctors, which is said to be nearly completed.

HUNT, WILLIAM MORRIS, an American painter, born in Brattleborough, Vt., March 31, 1824. He entered Harvard college in 1840, but went to Europe on account of his health before the completion of his course, and in 1846 entered the academy at Düsseldorf, with the intention of studying sculpture. At the expiration of 9 months he went to Paris, and in 1848 became a pupil of Couture, since which time he has followed painting as a profession. He contributed to the annual exhibitions in Paris from 1852 to 1855, and in the latter year returned to the United States, and has since resided at Newport, R. I. His paintings comprise history and *genre*, and among the most successful are several representing picturesque types of city life in Paris, of which the artist published a series of lithographs executed by himself in 1859.

HUNTER, HUMPHREY, an American patriot and clergyman, born near Londonderry, Ireland, May 14, 1755, died at Steele Creek, N. C., Aug. 21, 1827. His widowed mother emigrated to Mecklenburg co., N. C., in 1759. He was one of those who listened at Charlotte, May 20, 1775, to the famous Mecklenburg resolves. In the following year he served as a private soldier in a corps of cavalry against a force of tories

near Cross Creek, and as lieutenant against the Cherokee Indians. He studied at the Queen's museum, afterward called Liberty Hall academy, in Charlotte, till after the surrender of Charleston, when he again joined the army, and was taken prisoner at the battle of Camden. He effected his escape, and performed a gallant part in the battle of Eutaw Springs. Resuming his classical studies, he was graduated at Mt. Zion college in Winnsborough, S. C., in 1787, was ordained to the ministry of the Presbyterian church in 1789, and after holding other charges became pastor of the Steele Creek church in 1805, in which office he remained till his death.

HUNTER, JOHN, a British surgeon and physiologist, born at Long Calderwood, in the parish of Kilbride East, Lanarkshire, Feb. 13, 1728, died in London, Oct. 16, 1792. He was the youngest of a family of 10 children, and upon the death of his father, a farmer, remained at home with his mother, who allowed him to enjoy without restraint the pastimes peculiar to boyhood. At the age of 17 he was sent for the first time to school, which he found so irksome that he gladly availed himself of an opportunity to visit Glasgow, for the purpose of aiding a brother-in-law, who was a cabinet maker there, to extricate himself from his pecuniary embarrassments. The fact that he occasionally assisted the latter at his trade gave rise to the statement by one of his biographers that at one time of his life he had been a wheelwright or carpenter. The visit to Glasgow disgusted him with his idle and profitless career, and soon after his return to Long Calderwood he wrote to his brother William, then rising into eminence as an accoucheur in London, expressing a wish to study medicine, and offering to assist him in his anatomical labors. Receiving a favorable reply, he went to London in Sept. 1748, and almost immediately gave his brother satisfactory evidence of his talents for anatomy. After several months' tuition in the dissecting room, he was permitted during 1749-50 to attend the practice at Chelsea hospital, then under Cheselden, a man of great celebrity in his profession, and from whom he received his first instructions in surgery. Upon the retirement of Cheselden he became in 1751 a pupil at St. Bartholomew's hospital under Pott, whose lectures and operations he attended for several years, employing himself in the interim in the dissecting room of his brother, for whom he procured subjects for dissection. At the same time he indulged freely in the pleasures of city life, and in the choice of his companions and amusements evinced a coarseness of taste which was always a prominent trait in his character. With a view of improving his habits and connections, and also of fitting him to become a fellow of the college of physicians, William Hunter caused him in 1753 to be entered as a gentleman commoner in St. Mary's hall, Oxford. But this attempt "to make an old woman of him," as he called it, proved unsuccessful, and in the following year he became

surgeon's pupil at St. George's hospital, of which institution he was two years later appointed house surgeon, a position giving him ample opportunities to acquire a knowledge of practical surgery. In 1755 he was admitted to a partnership in the lectures of his brother, a certain portion of the course being allotted to him. He discharged this duty, however, under considerable embarrassment, and with a degree of difficulty for which the neglect of his early education will readily account, being always most at home in the dissecting room, where he soon became unrivalled among the surgeons of the day for his skill in making dissections and anatomical preparations. Pursuing at the same time a series of independent investigations in human anatomy, he succeeded in tracing the anatomy of the first pair of nerves within the nose, and in discovering the functions of the lymphatics and the cause and mode of descent of the testis in the fœtus. Having mastered the anatomy of the human frame, he turned his attention about 1758 to the study of comparative anatomy; but he had scarcely embarked in this pursuit, destined to afford the fullest development of his genius, when in 1759 he was prostrated by a severe fit of sickness, which ended in symptoms appearing to threaten consumption, and he was consequently obliged to seek a milder climate. Having received the appointment of staff surgeon in the army, he departed in the early part of 1761 with the expedition to Belleisle, and after the siege of that place served in Portugal until the peace of 1763, when he returned to England and was put on half pay. During this interval he amassed the materials for a work on gun-shot wounds, and pursued his anatomical and physiological researches on the bodies of recently killed soldiers and on those of a variety of animals. Upon establishing himself in London as a surgeon, he found the field so well supplied with skilful operators, that, notwithstanding his talents and professional acquirements, he was compelled as a means of subsistence to receive pupils in anatomy and surgery. With the pecuniary means derived from this source and from his half pay he purchased a piece of ground at Earl's Court, Brompton, about 2 miles from London, where he built a house, in which he carried on his experiments in comparative anatomy with unabated ardor. His zeal in procuring specimens amounted to enthusiasm, and he was in the habit of applying to the keepers of menageries for the bodies of dead animals, beside presenting rare animals to such collections on the condition that their carcasses should be restored to him. Every addition to his means was sure to witness a corresponding addition to his museum, and he would even importune his friends for money to further this object. Subsequently he added many rare species of living animals to his collection, and employed much time in watching their peculiar habits and instincts, for the purpose of exciting which he was accustomed to attack them playfully, and freely expose his per-

son to them. It was not until his life had been several times imperilled that he desisted from this dangerous amusement. His original papers on the changes which animal substances undergo in the stomach when acted upon by the gastric juice, on the growth of bones, &c., communicated to the royal society, and the occasional allusions in his brother's essays in the "Medical Commentaries" to his experiments and observations, having drawn attention to his efforts, he was in 1767 elected a fellow of the royal society, and in the following year surgeon of St. George's hospital and a member of the college of surgeons. His professional eminence may be said to date from this time; but he still devoted himself chiefly to physiological and pathological experiments, for conducting which his position afforded him ample opportunity. In these he was aided by several pupils who afterward acquired eminence in their profession, including Jenner, the discoverer of vaccination. In 1771 he was married to Miss Home, the sister of Sir Everard Home, his pupil and subsequently his biographer, and in the same year published his first original work, "Natural History of the Human Teeth" (4to., London), of which the second part appeared in 1778. In 1773 he commenced his first regular course of lectures, a task which he seldom succeeded in discharging with satisfaction to himself or his pupils, and as a preparation for which he was accustomed to dose himself with laudanum. In 1776 he was appointed surgeon extraordinary to the king, and at the request of the royal humane society drew up a paper on the best mode of restoring apparently drowned persons, which was published in the "Philosophical Transactions." His researches in comparative anatomy had not been allowed to slumber in the interval, and among his contributions to this science were papers on the action of the gastric juice upon the stomach after death, the torpedo, the electric eel, &c. His museum increased largely year by year, and a talented young artist named Bell whom he engaged about this time, and who remained with him 14 years, enriched it with many accurate drawings and delicate anatomical preparations. In the spring of 1777 he experienced an inflammation of the arteries of the brain, accompanied with alarming symptoms, the result of mental anxiety, and went to recruit at Bath, where Jenner pronounced his disease to be a serious organic affection of the heart. Between this period and 1785 appeared his papers on the heat of vegetables and animals, the structure of the placenta, the organs of hearing in fishes, &c., and the 6 Croonian lectures on muscular motion. The paper on the placenta, claiming for the author the discovery of the union between the uterus and placenta, which William Hunter had claimed in 1773 in his "Gravid Uterus," caused an estrangement between the brothers which only terminated a short time before the death of William. In 1785 he removed his whole museum to a house erected for the purpose in Leicester square, to which he

admitted the public in May and October of each year. It had now assumed enormous dimensions, and such was his reputation as a naturalist that no new animal was brought to the country which was not shown to him. In the same year he was prostrated by a severe spasmodic attack, a new form of the cerebral affection which he had experienced in 1777, and of which the first symptoms had appeared in 1773. He was again obliged to relinquish practice for a time, and thenceforth until his death he was a constant sufferer, his paroxysms occurring after any mental excitement, especially anger, to which he was always prone, so that, to use his own words, "his life was in the hands of any rascal who chose to annoy and tease him." He nevertheless persevered in his anatomical and physiological experiments, and in his surgical practice, which had now increased to such an extent that his brother-in-law, Dr. Home, was obliged to relieve him of a portion of it; and he was constantly performing operations then new to the art of surgery with a boldness, skill, and judgment equally remarkable. It was soon after his attack in 1785 that he practised the new method of tying the artery for popliteal aneurism, which has been called the most brilliant surgical discovery of the century. In 1786 appeared his "Treatise on the Venereal Disease" (4to., London; 4to., 1809, by Sir Everard Home; 4to., 1818, by Joseph Adams), and "Observations on Certain Parts of the Animal Economy" (4to., London; 8vo., 1837, by Prof. Owen), the latter a republication of papers from the "Philosophical Transactions," and of others on anatomical and physiological discoveries by the author. In the same year he was appointed surgeon-general of the army, and in 1787 he received the Copley gold medal from the royal society for papers on the ovarium, the specific identity of the wolf, jackal, and dog, and on the structure and economy of whales. He was about this time chosen a member of the American philosophical society, having previously received distinguished honors from the chief European scientific associations. Soon after he published valuable papers on the treatment of inflamed veins, on intussusception, and on the mode of conveying food into the stomach in cases of paralysis of the œsophagus; and in 1792 he contributed his last paper to the "Philosophical Transactions," entitled "Observations on the Economy of Bees," a subject he had carefully studied for 20 years, and on which he is still to a considerable extent an authority. In this year he resigned his lectureship at St. George's hospital, and devoted himself to the completion of his work on inflammation. His spasms meanwhile increased in frequency and intensity, and were excited by the most trivial occurrences. On Oct. 16, 1793, while attending a meeting of the board of directors of St. George's hospital, he became violently excited by a remark made to him by one of his colleagues, and leaving the room hastily to conceal or repress his anger, he fell with a

groan into the arms of Dr. Robertson, one of the physicians of the society, and instantly expired.—As a surgical operator merely, John Hunter was undoubtedly one of the greatest men of his time, and no one of his successors has acquired a popularity more universal or deserved. As an anatomist and physiologist, moreover, he displayed a keenness of intellect, a faculty of generalization, and a philosophic turn of mind, which must rank him among the greatest of modern natural philosophers, and of which he has left an enduring monument in the celebrated museum named after him, and which was in 1799 purchased by the nation and placed in the keeping of the college of surgeons. Of this collection Professor Owen, who spent 10 years in cataloguing it, says: "Hunter's genius indeed had penetrated far back into the zoology of other days, and in his museum he left behind him the germ of all the surpassing discoveries since made in palæontology; he left enough to prove that his acute mind had embraced even this vast subject, and had appreciated the stores of matter to be derived from its study." In consideration of his limited resources, his shattered health, and arduous professional duties, the labor bestowed upon this collection is almost incredible. At the time of his death it contained upward of 10,000 preparations illustrating human and comparative anatomy, physiology, pathology, and natural history, so arranged as to exhibit the gradations of nature from the simplest form of life up to man. The physiological series, which comprised considerably more than half the collection, contained 1,000 skeletons, 3,000 animals and plants illustrating natural history, stuffed or preserved in spirits, and 1,200 fossils, beside monsters and other eccentric forms of animal life. The whole museum now contains over 25,000 specimens arranged in two apartments, of which one is devoted to physiological or normal, and the other to pathological or abnormal structures. He left in addition 19 MS. volumes of materials for a catalogue of his museum, the preparation of which occupied him during the last few years of his life. The completion of the work was assigned to Sir Everard Home, his executor, who was intrusted for that purpose with the 10 most valuable volumes, which he subsequently burned, in accordance, as he said, with Hunter's express desire; although it is now pretty certain that he destroyed them to conceal his own appropriation of their contents in the preparation of the anatomical papers which pass under his name. Hunter was a man of warm and impetuous temper, readily provoked, and when irritated not easily soothed; but at the same time generous, and free from reserve or deceit. In his investigations he rigidly adhered to facts, making no fanciful excursions into the regions of speculation, but pursuing the truth with mathematical precision. After his death appeared his "Treatise on the Blood, Inflammation, and Gun-shot Wounds," preceded by a biography by Sir Everard Home

(4to., London, 1794); and in 1835-'7 his surgical works, with notes by J. F. Palmer, were published in 4 vols. 4to. with an atlas of 60 plates. Biographies of him have also been published by Jesse Foot (8vo., London, 1794) and Joseph Adams (8vo., 1816). His remains, after a repose of more than half a century under the church of St. Martin-in-the-Fields, were in March, 1859, disinterred by the royal college of surgeons, and on the 28th of the month deposited with much ceremony in Westminster abbey, next to the remains of Ben Jonson, where a monument to his memory is to be erected.—His wife, ANNE HOME HUNTER, born in 1741, died in 1821, was a woman of much literary culture, who published in 1802 a volume of poems, several of which were set to music by laydun. Among the pieces attributed to her is the "Song of Alknomoock," which is also included in the published editions of the American poet Philip Freneau.—WILLIAM, brother of the preceding, a Scottish physician and anatomist, born at Long Calderwood, Lanarkshire, May 23, 1718, died in London, March 30, 1783. He was sent by his father to the university of Glasgow, with a view of studying for the ministry; but manifesting a decided distaste for theological pursuits, he was permitted to choose his own profession. The example of Dr. William Cullen, then established in practice in Hamilton, and whose acquaintance he formed about 1737, drew his attention to medicine, and in that year he went to reside in his family as a medical student. At the end of three years a partnership was formed between them, by the terms of which Hunter was to take charge of the surgical part of the practice. For the purpose of preparing himself for this duty, he went through a course of preparatory study in Edinburgh and London, and while in the latter city in 1741 gained admittance into the family of Dr. James Douglas as dissector for a work on the anatomy of the bones which the latter was preparing, and as tutor to his son. At the same time he pursued his studies in surgery, anatomy, and dissection under competent masters. Dr. Douglas died in 1742, but Hunter continued to reside in the family as tutor to his son, and, having formed the design of establishing himself in London as a teacher of anatomy and a general practitioner, found no difficulty in cancelling his agreement with Cullen, between whom and himself a warm friendship existed for life. In the winter of 1746 he made his first appearance as a lecturer on the operations of surgery before the society of navy surgeons, and such was the favor with which he was received that he was invited to extend his course to anatomy. About the same time he began to acquire an extensive practice both as a surgeon and an accoucheur; but having in 1748 received the appointment of surgeon accoucheur to the Middlesex hospital, and in 1749 to the British lying-in hospital, he abandoned surgery, a line of practice which he had always disliked, and thenceforth devoted himself almost exclusively to midwifery. The moment

was auspicious, as the chief authority in obstetrics, Snellie, was rude in manners and personally unpopular, and the death of Sir Richard Manningham and the retirement of Dr. Sandys, who divided between themselves the most lucrative part of the practice, left the field in a measure open to Hunter. The latter, having obtained in 1750 the degree of M.D. from the university of Glasgow, soon eclipsed all rivals in his speciality, and for the last 30 years of his life probably held the first rank in his profession as a practitioner and lecturer in obstetrics. About this time he established himself in a house in Jermyn street, where he commenced the formation of a large anatomical museum, the collection of Dr. Sandys, which he had recently purchased, forming the nucleus. In 1754 he entered into a professional partnership with his brother John, whose industry was of great use in adding to the contents of the museum. In consequence of the illness of John, however, the partnership terminated in 1759. Subsequently Hewson and Cruikshank, both eminent as anatomists, were successively his partners. In 1762 he officiated as consulting physician to Queen Charlotte, and two years later was appointed her physician extraordinary. In 1762-4 appeared his "Medical Commentaries, Part I." (4to., London), which contained also an account of his controversy with Professor Monro as to the authorship of the doctrine of absorbent action of the lymphatic system, and of the method of injecting the testes with mercury. The latter had been demonstrated by Hunter to his class as early as 1752. In 1765, being then in the receipt of large professional emoluments, he took the first step toward carrying into effect a long cherished scheme for appropriating a portion of his savings to some work of public utility, by applying to Mr. Grenville, then minister, for a piece of ground in the Mews for the site of an anatomical museum. Notwithstanding that he offered to expend £7,000 on the building, and to endow a professorship of anatomy, the application was unfavorably received, and he accordingly purchased a spot of ground in Great Windmill street, and erected the necessary buildings, into which he removed in 1770 with his whole collection. Thenceforth one of the main objects of his life was to add to the anatomical specimens which his museum contained. From time to time the collections of eminent practitioners offered for sale were purchased and incorporated in it, and the zeal of friends and pupils whom he had enlisted in his cause procured him a great number of morbid preparations. Not contented with his anatomical collection, which was one of the most extensive in Europe, he presently began to accumulate fossils, books, coins, and other objects of antiquarian research. His library was said to contain "the most magnificent treasure of Greek and Latin works accumulated since the days of Mead;" and his coins, of a portion of which a description was published by his friend Mr. Combe, under the title of *Nummorum Veterum Populorum et Urbium, qui in Museo*

Gulielmi Hunteri asserverantur, Descriptio Figuris Illustrata, cost upward of £20,000. In 1781 Dr. Fothergill's collection of shells, corals, and other objects of natural history, was added to the museum at an expense of £1,200. The whole collection, with a fund of £8,000 for its support and augmentation, was bequeathed after the determination of certain life interests to the university of Glasgow, where, under the name of the Hunterian museum, it is now deposited. In 1774 appeared his *Anatomia Humani Uteri Gravidæ, Tabulis (34) Illustrata*, in Latin and English (atlas fol., Birmingham; fol., London, 1828), which was intended to form the second part of his medical commentaries, and on which he had been engaged since 1751. It has been called one of the most splendid medical works of the age, the engravings, which are remarkable for their beauty, having been executed by the most eminent artists. A work describing the engravings, entitled "An Anatomical Disquisition of the Human Gravid Uterus and its Contents" (4to., London), was published in 1794 by his nephew Dr. Baillie. The subsequent claim of John Hunter to the discovery of the mode of union between the placenta and the uterus, as described by William in this work, caused a bitter hostility between the brothers, which lasted until the elder was on his death-bed, when a reconciliation took place. William Hunter was the recipient of various professional honors during the latter part of his life, including the appointment by the king to the professorship of anatomy in the royal academy of arts, the duties of which he discharged with great ability. In 1767 he was elected a fellow of the royal society, and two years before his death he became president of the medical society. In addition to the works mentioned, he contributed important papers to the medical and scientific periodicals of the day, and left several lectures and unfinished works in manuscript. He was universally esteemed one of the chief ornaments of the medical profession in the 18th century, and by his anatomy of the gravid uterus, his description of varicose aneurism, and other professional labors, materially advanced the sciences of anatomy and midwifery. Although naturally irascible, he was polished and courteous in manner, and unsurpassed as a lecturer by any of his contemporaries. Without being parsimonious, he exercised a careful economy in his domestic affairs, and was thereby enabled to expend the large sum of £70,000 for the benefit of science, beside leaving an ample fortune.

HUNTER, ROBERT MERCER TALIAFERRO, an American statesman, born in Essex co., Va., April 21, 1809. He was graduated at the university of Virginia, and, choosing the law for his profession, attended the lectures of the late Judge Henry St. George Tucker, who had opened a law school at Winchester, in Frederic county. In 1830, just after reaching his majority, Mr. Hunter returned to Essex county, and commenced the practice of his profession. He soon began to take an active part in poli-

tics, and at the age of 24 was elected to the house of delegates. His first vote had been given for Jackson in 1832, but the doctrines of the proclamation and the force bill had driven him in common with many of the warmest friends of the president from his party, and it was as an opponent of those measures that Mr. Hunter was elected. He remained in the house of delegates for 3 sessions until 1837, when he was elected as the representative of the Essex district in congress. In the discussions growing out of the commercial convulsion of that year, he at once took his stand on the side of the administration in favor of the independent treasury bill. His first speech was made in Oct. 1837. After reviewing the evils of the existing system of banking in America, opposing a national bank as both unconstitutional and dangerous, and presenting the yet weightier objections to the private bank measure, he declared his adhesion to the principles of the bill, strongly advocating the propriety of a complete divorce of the government from all banks, whether state or national. In this speech Mr. Hunter developed those principles of free trade to which he has consistently adhered throughout his public career. At the subsequent session of congress, he again spoke at length in support of the independent treasury bill, discussing elaborately the subjects of banking and finance. He sustained the measure on the ground that it afforded a salutary check to the mischievous operations of the banking system upon foreign trade; that it took away the bounty heretofore offered by the government to the states for the depreciation of their currency, and removed the unequal operation of the fiscal system upon the commerce of the different states and sections; that it relieved the general government from its dependence upon the state institutions; and lastly, that it took from the executive an immense amount of bank patronage and the power to alter the standard of value. At the closing session of the same congress Mr. Hunter, as chairman of a select committee, made a report sustaining the principles advocated in his speeches. In the succeeding congress he was elected to the speakership; and at the close of his term of service, the usual vote of thanks was passed without a dissenting voice, in a house of representatives which was perhaps as strongly marked by partisan bitterness as any other in the history of the government. The extra session in the spring of 1841 was the scene of great party excitement and conflict. The presidential contest of the preceding year had resulted in the success of the whig party; and having decided majorities in both branches of congress, they brought forward, and pressed ardently, under the leadership of Mr. Clay, their favorite measures of a national bank, the distribution of the proceeds of the public lands, and a protective tariff. To these was added a general bankrupt law. The contest upon these measures was prolonged and bitter. The initiative measure

of the whig policy, calculated upon the presumed adoption of the others, was the loan bill. Mr. Hunter spoke in opposition to it on July 10, 1841, reviewing at length the whole policy of the "American system," and vigorously opposing it. He spoke at the same session in opposition to the bill for the incorporation of a fiscal bank of the United States. At the regular session of 1841-'2, Mr. Hunter spoke upon President Tyler's veto of the temporary tariff bill, sustaining the exercise of the veto in this particular instance, and denouncing any attempt to modify or abolish this provision of the constitution. A few days later, Mr. Hunter addressed the house on the general tariff bill, stating in full his objections to the bill, which was highly protective in its character, and to the system upon which it rested, and contending that the greatest results for American capital and labor would be obtained by a removal of legislative impediments upon commerce and enterprise. At the election in the spring of 1843 for members of the 28th congress, Mr. Hunter was defeated by a small majority, mainly on account of his adherence to that clause of the independent treasury scheme requiring all dues to the government to be paid in specie. At the next congressional election, which was in 1845, Mr. Hunter was successful. The leading questions before the country during his absence from congress were the annexation of Texas, and the various measures respectively represented by Mr. Polk and Mr. Clay, and agitated in the presidential canvass of 1844. Mr. Hunter was a warm friend of annexation, and of Mr. Polk's elevation to the presidency. He was the first prominent public man who brought before the country the idea of immediate annexation. This was done in speeches at dinners given him by his late constituents of the counties of Essex and King William in 1843, and before the appearance of Mr. Robert J. Walker's well known letter. At the session of 1845-'6, the Oregon question, which had gradually been leading the United States and Great Britain to the verge of war, was formally brought to the attention of congress by the president. The negotiation begun by Mr. Calhoun, toward the close of Mr. Tyler's administration, and renewed under that of Mr. Polk, had failed. The offer of the U. S. government for a compromise on the line of 49° had been refused. A large party in the country were for immediate measures to terminate the joint occupancy by the two nations, and for an exclusive occupation by the United States of the disputed territory. Mr. Hunter was of the number of those who opposed these measures. One of his ablest speeches was made at an early period of the session, in support of a reasonable and fair compromise. After a long and excited debate, both branches of congress by large majorities rejected this pacific policy. At this session Mr. Hunter also took a leading part in favor of the retrocession of Alexandria to the state of Virginia. He also spoke in support of the

tariff bill of 1846, which was based upon the revenue principle, and abolished the specific duties and minimum valuation of the act of 1842. The warehousing system was at this session first incorporated into the revenue laws. By this act merchants were enabled to put their goods as they arrived in the public stores, and to withdraw them for consumption or exportation at such times and in such quantities as their interests and the state of the market might suggest. The duties were not to be paid until the goods were withdrawn for consumption. This bill, which benefited the merchant without diminishing the revenues of the government, originated with Mr. Hunter, and was drawn by him. In May, 1846, the United States had become involved in successful hostilities with Mexico, and it became apparent that the war would result in large acquisitions of new territory to the Union. The free soil party at once sought to impose as a condition upon any grant of money for the purposes of a treaty with Mexico, that in any territory to be acquired by such treaty slavery should be for ever interdicted. To this end Mr. Wilmot of Pennsylvania offered his celebrated proviso. Mr. Hunter, in common with other southern representatives, resisted the application of the Wilmot proviso. He voted for all the measures necessary to prosecute the war to a just and honorable conclusion, but altogether opposed the project, favored by some, of incorporating the whole of the Mexican states into our political system. During the winter of 1846-7 Mr. Hunter was chosen by the legislature of Virginia to the U. S. senate, and took his seat in Dec. 1847. At this time the slavery agitation had greatly increased throughout the country; the free soil party aiming to apply the Wilmot proviso to all the new territory to be acquired, and the South demanding the right to go there with their slave property, or a partition of the new territory upon some line or principle of division. The bill for the territorial government of Oregon brought the whole subject under review and discussion. Mr. Hunter spoke upon this bill, vindicating the position assumed by Virginia and the other southern states in reference to these questions. While the debate was pending Mr. Clayton of Delaware brought forward his proposition for a compromise, afterward known as the "Clayton compromise." This bill provided governments for the territories of Oregon, California, and New Mexico, free from any restriction as to slavery, and based on the principle of non-intervention—the judicial tribunals to determine the vexed questions between the North and the South. Mr. Hunter gave his cordial support to this measure, and it passed the senate by a large majority, but was lost in the other house. The consequence was that the excitement continued to increase, and entered largely into the discussions of the presidential election of 1848. At the session of 1848 an effort was made, by Mr. Walker's amendment, to extend the laws of the United States over California. This amendment was

sustained by Mr. Hunter, and passed the senate; but it was defeated in the house by a free soil majority, who were unyieldingly bent on securing the adoption of the Wilmot proviso. With the first session of Gen. Taylor's administration, the slavery agitation reached a higher point of violence than it had ever done before. Mr. Hunter took a leading part in the debates, and was willing to agree to any fair compromise which should save the honor and the rights of the South and the state which he represented. In this spirit he had voted for the Walker amendment, the Clayton compromise, and the extension of the Missouri compromise line to the Pacific ocean. But he condemned the executive proceedings in relation to California and the Texas boundary, and opposed the bill for the abolition of the slave trade in the district of Columbia, or any interference with that institution in the states or territories. He voted in common with the body of southern senators against the admission of California, regarding the proceedings attending her state organization as a lawless usurpation. The fugitive slave law received his cordial support. At this session Mr. Hunter delivered an elaborate and important speech upon the proposition to suspend diplomatic relations with Austria. This movement proceeded, not upon any misunderstanding or conflict between the American government and Austria, but solely upon the ground of the wrongs inflicted upon Hungary. Mr. Hunter strongly opposed the measure in question, or any other intervention in European politics. The non-intervention policy marked out by Washington and Monroe he declared to be the true theory of action, and deprecated any departure from it. At the session of 1850-51, Mr. Hunter was made chairman of the finance committee of the senate, a post he has ever since retained. In this important and laborious position he has necessarily given especial attention to the business of congress, and has been noted rather for hard work than for displays of oratory. At this session we find his name connected with the debates on appraisements under the revenue laws, the postage bill, and bills for appropriation. During the sessions of 1851-2 and 1852-3, he spoke upon the bill granting lands to Iowa for railroad purposes; upon the deficiency bill, and government expenditures; upon the river and harbor bill; the payment of the Texas debt, &c. As chairman of the finance committee he made an elaborate report upon the gold and silver coinage of the country, and initiated the reduction in the value of the silver coins of 50 cents and less, by which their shipment to foreign countries was arrested. In the presidential canvass of 1852, between Gen. Scott and Gen. Pierce, Mr. Hunter, at the request of the democratic association of Richmond, delivered an address before that body tracing the history of parties from the foundation of the government, and urging powerfully the soundness of the states' rights school. At the expiration of his first term in the senate he was reelected by a very

flattering vote, every democrat in the legislature supporting him with a single exception, and one half of the whigs. The most important topic before this congress was the bill introduced by Mr. Douglas in the senate, providing for the territorial organization of Kansas and Nebraska, and the repeal of the Missouri restriction. Mr. Hunter spoke and voted in favor of the bill. He also spoke against the homestead bill, the river and harbor bill, the president's veto on the bill granting lands to the indigent insane, upon the Texas debt bill, in favor of the project of a court to investigate claims against the United States, &c. The year 1854 was marked by the organization of the American or know-nothing party. Mr. Hunter, in common with the great majority of the democratic body, vigorously opposed the new party, as proscriptive of the rights of the citizen, and as hostile to republican government. He took the field in the spring of 1855, when Mr. Wise was canvassing the state as candidate for governor, and made elaborate addresses at Richmond, Petersburg, and other prominent places in Virginia. In his speech at Petersburg especially, the speaker strongly inveighed against the secret feature, declaring that no party which refused to submit its action to the "wholesome jurisdiction" of public opinion could be worthy of confidence. He stigmatized as unrepblican the anti-Catholic policy of the Americans, and drew an eloquent picture of the good deeds of the sisters of charity and of the character and merits of the Catholic portion of the community. The canvass terminated in the election of Gov. Wise, to which result the exertions of Mr. Hunter no doubt largely contributed. The congressional session of 1855-'56 was marked by a continuance of the slavery agitation which had followed the Kansas-Nebraska act. The republican party had been organized with a view to the election of a president who should represent their views, and the session was characterized by excited feeling and debate. Mr. Hunter spoke at this session upon the admission of Kansas, upon the Massachusetts resolutions in respect to the assault upon Mr. Sumner, upon the jurisdiction of the court of claims, the increase of the navy, the power of congress to make appropriations for rivers and harbors, &c. The republican majority in the house having made an attempt to compel the senate to concur in their amendment to the army appropriation bill, which forbade the employment of any portion of the army in aiding to execute the laws of Kansas, Mr. Hunter took a prominent part in opposition to this attempt. A few days before the presidential election of 1856, Mr. Hunter addressed a mass meeting of the New York democrats at Poughkeepsie, in advocacy of the election of Mr. Buchanan. The session of 1856-'57 was noted for the passage of the tariff act of 1857, a bill framed by Mr. Hunter. By this act the duties were considerably lowered, the articles used as component parts in manufactures were placed upon the free list, and

the total amount of revenue reduced. During the winter of 1857-'58, Mr. Hunter was a third time chosen senator by the legislature of Virginia, only 10 out of about 160 members voting for other candidates. At this session Mr. Hunter advocated the admission of Kansas into the Union under the Lecompton constitution. He was a member of the committee of conference which reported the proposition commonly called the "English bill," which was finally adopted by congress. He spoke at the same session upon the treasury note bill, the admission of Minnesota, the appropriation bills, &c. At the session of 1858-'9 an effort to alter the tariff of 1857, and to increase the duties, was resisted by Mr. Hunter in an elaborate speech, and failed. In addition to the speeches and addresses already referred to, Mr. Hunter has delivered others of a character less exclusively political, but all of them developing his philosophical theory of government. The most important perhaps of these was an oration pronounced at Richmond, Feb. 22, 1858, on occasion of the inauguration of Crawford's statue of Washington. Upon the question of popular sovereignty in the territories the views of Mr. Hunter were thus expressed in a speech on the Kansas-Nebraska act in 1854: "In my opinion, the government of these territories ought to be administered with the double object of securing the rights of the states as well as those of the people of the territories, and to these last should be given all the rights of self-government which are consistent with the limitation that they shall not interfere with the equal rights of the states, or violate the provisions of the constitution. With these limitations all the power that could possibly be given to the people of that territory, ought to be given to them. . . . And if they should assume powers which are thought to be inconsistent with the constitution, the courts will decide that question whenever it may be raised. There is a difference of opinion among the friends of this measure as to the extent of the limits which the constitution imposes upon the territorial legislatures. The bill proposes to leave these differences to the decision of the courts. To that tribunal I am willing to leave this decision." On Jan. 31, 1860, Mr. Hunter made in the senate an elaborate speech in defence of slavery and of the right of the slaveholder to carry his slaves into the territories. He maintained that free society was yet only an experiment of doubtful success, while slavery had received the sanction of ages and of all nations.

HUNTERDON, a W. co. of N. J., separated from Pennsylvania on the W. by Delaware river, bounded N. W. by the Musconetcong, E. in part by the Lamington, and drained by branches of Raritan river; area, 480 sq. m.; pop. in 1855, 30,410. The surface is level in the centre and mountainous toward the N. and S. Limestone and freestone are abundant, and the hills are well timbered. The soil of the valleys is fertile. The productions in 1850 were 188,828 bushels of wheat, 954,788 of Indian

corn, 133,662 of rye, 679,539 of oats, 32,247 tons of hay, 60,489 lbs. of wool, and 975,679 of butter. There were 25 flour mills, 24 straw manufactories, 14 tanneries, 3 newspaper offices, 62 churches, and 4,959 pupils attending public schools. The New Jersey central and the Belvidere Delaware railroads traverse the county, a branch of the latter extending to Flemington, the capital.

HUNTINGDON, a central co. of Penn., drained by the Juniata river and its tributaries; area, 730 sq. m.; pop. in 1850, 24,786. It has a very diversified surface, occupied in part by mountains, and noted for its fine scenery. Iron, lead, coal, salt, and alum are found, and timber is abundant. The valleys are fertile. The productions in 1850 were 365,278 bushels of wheat, 221,392 of Indian corn, 230,126 of oats, 41,296 of potatoes, 51,384 lbs. of wool, 331,263 of butter, and 17,842 tons of hay. There were 40 grist mills, 34 saw mills, 16 tanneries, a large number of furnaces and factories, 2 newspaper offices, 57 churches, and 5,925 pupils attending public schools. The Pennsylvania central railroad passes through the county, and connects with the Huntingdon and Broad Top railroad at Huntingdon, the capital.

HUNTINGDON, a co. at the S. W. extremity of Canada East, bordering on New York, and bounded N. W. by the river St. Lawrence; area in 1851, 488 sq. m., pop. 40,645, since which time its territory has been reduced by the act of 1853. It has an undulating surface and a fertile soil. Capital, Huntingdon.

HUNTINGDON, **SELINA**, countess of, a patron of the Calvinistic Methodists in England, born in 1707, died June 17, 1791. She was one of the 3 daughters of Washington Shirley, earl of Ferrers, and at the age of 21 was married to Theophilus Hastings, earl of Huntingdon, a man distinguished for piety. His sudden death in 1746, and also the death of 4 of her children in youth, caused her to become deeply religious. During the religious revival which the efforts of Wesley and Whitefield were then effecting, she attached herself to the opinions of the latter, and by her zeal and wealth exerted so much influence over the Calvinistic Methodists that a branch of them became known as "the countess of Huntingdon's connection." She built chapels, supported ministers, and by the aid of opulent persons, many of them members of her own family, established a college at Trevecca, in South Wales, for the education of Calvinistic preachers. This college was removed after her death to Cheshunt, Herts, where it still exists, and for the support of it and also of her chapels she left a trust. According to the census of 1851, there were 109 chapels belonging to her connection, with accommodations for 38,727 hearers. The congregational polity prevails among the societies, some of which have formally identified themselves with the Congregationalists.

HUNTINGDON, **WILLIAM**, S.S. (sinner saved), an English Antinomian preacher, born in Kent

in 1744, died in London in Aug. 1813. The son of a farmer's laborer, he was employed in the early part of his life as a coal-heaver and in other menial service. While indulging in vicious and dissipated courses he was converted, became a zealous preacher among the Calvinistic Methodists, and began to expound the Scriptures in a most eccentric and curious manner. He possessed considerable uncultivated talent, drew together a large number of followers, denounced all other ministers as heretical, and wrote a vast number of controversial tracts. He travelled through the country, gaining disciples wherever he went, and chapels still exist in Sussex and other counties where his tenets continue to be taught. His second wife was the relict of a wealthy London alderman, and he passed the latter part of his life in affluence. He gave the following explanation of the letters S.S. which he added to his name: "As I cannot get a D.D. for the want of cash, neither can I get an M.A. for want of learning; therefore I am compelled to fly for refuge to S.S. by which I mean, sinner saved." His writings, some of which rank among the curiosities of theological literature, were published in 1820 (20 vols., London). His select works, edited by his son, appeared in 6 vols. in 1838, and were reprinted in 1856.

HUNTINGDONSHIRE, an inland co. of England, surrounded by Cambridgeshire, Northamptonshire, and Bedfordshire, 29 m. in length from N. to S., and about 20 m. from E. to W.; area, 361 sq. m.; pop. in 1851, 64,183. The N. E. portion forms part of the fen district (see **BEDFORD LEVEL**), and is devoted chiefly to grazing. In the W. and S. parts the surface is slightly varied by the swell of two low ridges of hills. In the S. E. is an extensive plain of fertile land, and along the banks of the Ouse and Nene are rich meadows overflowed at high tides. The general character of the soil is either gravelly or clayey loam. Although the greater part of the county was once a royal forest, it is now very bare of timber. Agriculture is the only industry. The products are wheat, oats, and beans, with some barley, hops, hemp, turnips, and mustard seed. The chief rivers are the Ouse within the county, and the Nene along the border, with their tributaries. In the fen district are 2 lakes, or "meres," viz.: Ramsey, about 700 acres, and Ugg mere, of smaller size. These meres teem with fish, and are frequented by multitudes of water fowl. Projects have been broached more than once to have these lakes drained, as the water is shallow and their basins are composed of rich alluvium. A considerable extent of marsh has been brought under cultivation, and other portions have been planted with willows. Huntingdonshire is the smallest of the English counties excepting Rutland and Middlesex. It sends 2 members to parliament, in addition to 2 from the borough of Huntingdon. The chief towns are Huntingdon, St. Ives, St. Neots, and Ramsey. It gives the title of earl to the family of Hastings.

HUNTINGTON, a N. E. co. of Ind., drained by Wabash and Salamonie rivers; area, 384 sq. m.; pop. in 1850, 7,850. The surface is slightly uneven and the soil fertile. The productions in 1850 were 76,750 bushels of wheat, 216,173 of Indian corn, 27,037 of oats, 9,675 lbs. of wool, and 2,707 tons of hay. There were 6 grist mills, 8 saw mills, 2 newspaper offices, 6 churches, and 1,500 pupils attending public schools. The Wabash and Erie canal, and the Toledo, Wabash, and western railroad, pass through Huntington, the capital.

HUNTINGTON, DANIEL, an American painter, born in New York, Oct. 14, 1816. His predilection for painting is said to have been first excited during a visit to the studio of Trumbull, whither his mother, a relative of the painter, was in the habit of taking him occasionally. His first efforts in drawing, however, failed to elicit any expression of approbation from Trumbull, who decidedly discouraged the idea of his attempting to become an artist. Subsequently, while pursuing his studies at Hamilton college, N. Y., he made the acquaintance of Charles L. Elliott, the portrait painter, who was then travelling in the practice of his vocation, and from whom he received a decided bias for his art. Having sat to Elliott for his portrait, he proceeded, with implements borrowed from him, to take the likenesses of his college companions, for whose amusement he also painted a number of comic pieces. In 1835 he entered the studio of Professor Morse, then living in New York, and president of the national academy of design, and soon after produced the "Bar-Room Politician," "A Toper Asleep," &c., beside some landscapes and portraits. Leaving Mr. Morse in 1836, he spent several months in the vicinity of the Hudson highlands, and executed views near Verplanck's, the Dunderberg mountain, and Rondout creek at twilight and sunset. In 1839 he went to Europe, and in Florence painted the "Sibyl" and the "Florentine Girl," the former his first essay in history, a branch of his art to which he has since devoted much attention. Removing to Rome soon after, he painted the "Shepherd Boy of the Campagna" and "Early Christian Prisoners," both of which were purchased by New York collectors. Upon his return to New York he was employed for a long time almost exclusively upon portraits, his only historical pieces of importance being "Mercy's Dream" and "Christiana and her Children," from the "Pilgrim's Progress." For two years he was compelled by an inflammation of the eyes to relinquish his labors, and in 1841 went again to Rome, where he passed the succeeding winter, and whence he sent back to America the "Roman Penitents," "Italy," the "Sacred Lesson," the "Communion of the Sick," and some landscapes. Upon his return to New York in 1846 he again devoted himself chiefly to portraits. During the last few years he has made several visits to England, but is now a permanent resident of New York. In addition to the works above mentioned, he has painted "Lady

Jane Grey and Feckenham in the Tower," "Henry VIII. and Queen Catharine Parr," the "Marys at the Sepulchre," "Queen Mary signing the Death Warrant of Lady Jane Grey," which was engraved for the American art union, &c. He recently painted in England another picture of "Mercy's Dream," which Barlow is now (1860) engraving.—JEDIDIAH VINCENT, brother of the preceding, an American author, born in New York in Jan. 1815. He was educated as a physician, but after several years' practice he became in the latter part of 1839 a candidate for orders in the Protestant Episcopal church, and was also a teacher in St. Paul's college, at College Point, Long island. After officiating for a short time as rector of an Episcopal church in Middlebury, Vt., he travelled in Europe, spending several years in Italy. Since 1849 he has been a Roman Catholic. He edited for some time the Baltimore "Metropolitan Magazine," and subsequently removed to St. Louis, Mo., where he started a religious weekly newspaper called the "Leader," which was soon changed to a daily political paper. He now resides in New York. He is the author of a volume of "Poems" (12mo., New York, 1843); "Lady Alice, or the New Una," a novel devoted to art, religion, and the fashionable world, which was published during his residence abroad (3 vols. 8vo., London, 1849), and which is the most popular of his works; "Alban" (2 vols. 12mo., New York, 1850); "The Forest," a sequel to "Alban" (12mo., 1852), &c., beside a number of translations. His latest work is "Blonde and Brunette" (12mo., New York, 1859), published anonymously.

HUNTINGTON, FREDERIC DAN, D.D., an American clergyman, now preacher to the university and Plummer professor of Christian morals in Harvard college, Cambridge, born in Hadley, Mass., May 28, 1819. He was graduated at Amherst in 1839, and studied 3 years in the divinity school of Cambridge. In 1842 he was ordained pastor of the South Congregational church in Boston, which he left in Sept. 1855, and was inaugurated into the office he now holds, which includes that of pastor of the church in Harvard college. In his doctrinal views he is entirely independent; and although formerly calling himself a Unitarian, he has gradually, but decidedly, withdrawn from that body. Among his measures in his present office which have attracted most attention, is the relinquishment of afternoon preaching in the college chapel, and the substitution of a service formed from those in use in the principal branches of the Christian church, with some novel and original additions. He has published a great number of articles in prose and verse in the various miscellanies and reviews of the day, and many occasional sermons and addresses printed separately, some of which have been repeatedly published in various forms, during the last 20 years. He has also published a volume of "Sermons for the People" (1856), which has already passed to the 6th edition; and recently a volume of

"Sermons on Christian Living and Believing" (12mo., 1860), and a volume of lectures, being a course of Graham lectures at the Brooklyn institute, repeated before the Lowell institute in Boston, on "Human Society, as illustrating the Wisdom, Power, and Goodness of God" (8vo., 1860).

HUNTINGTON, SAMUEL, an American statesman and jurist, one of the signers of the declaration of independence, born in Windham, Conn., July 3, 1732, died in Norwich, Jan. 5, 1796. He was educated to the law, and previous to 1775 held the offices of king's attorney and associate justice of the superior court of Connecticut. In Jan. 1776, he entered the continental congress as a delegate from his native state. In Sept. 1779, he succeeded John Jay as president of congress, and discharged the functions of that office until July, 1780, when he resumed his seat on the Connecticut bench. He served again in congress from May to June, 1783, and in the succeeding year was appointed chief justice of the superior court of Connecticut. In 1785 he was elected lieutenant-governor of Connecticut, and in 1786 he succeeded Roger Griswold as governor, to which office he was annually re-elected until his death.

HUNTSVILLE. I. The capital of Madison co., Ala., in the N. part of the state, 153 m. N. N. E. from Tuscaloosa; pop. in 1854, about 4,000. It is a station on the Memphis and Charleston railroad, situated about 10 m. N. from the Tennessee river, is well built, and contains a handsome brick court house in the Grecian style of architecture, erected at a cost of \$45,000. The other principal buildings are the bank (which cost \$80,000, constructed of hewn stone, with an Ionic portico), a female seminary, a market house, and 6 or 7 churches. There are 3 newspaper offices. II. The capital of Walker co., Texas, in the E. part of the state, about 12 m. S. W. from Trinity river, and 180 m. E. N. E. from Austin; pop. in 1858, 892. It is pleasantly situated on high ground, in the midst of a rich cotton region, has an active business, is well built, and is the seat of Austin college, a flourishing institution under the care of the Presbyterians, of the Andrew female institute (Methodist), and of the state penitentiary. The penitentiary was built in 1848-'9. Its site embraces an area of 5 acres, and a timber tract of 98 acres belongs to it. The walls enclose an area of 11,000 square yards. There are 240 cells, workshops, a hospital, and a building for factory purposes 2 stories high, 270 feet long, and 50 feet wide. An appropriation of \$35,000, since raised to \$69,000, was made by the legislature of 1853-'4 for the purchase of machinery for manufacturing plantation goods. There are 40 looms and 896 spindles for cotton, and 200 spindles for wool. About \$80,000 worth of fabrics can be made annually. The number of convicts in 1857 was 102.

HUNYADY, JÁNOS (JOHN HUNNIADES), a Hungarian general and statesman, born toward the close of the 14th century, died in 1456.

His birth and youth are wrapped in legendary obscurity, as is the origin of his surname Corvinus (Hollósi). Under the reign of Albert (1437-'9) he became ban of a province south of the Danube, and under Uladislas I. (1439-'44) count of Temes and commander of Belgrade. Shortly after the latter appointment he repulsed a Turkish army of invasion from his province, and soon after routed the same in Transylvania (1442). In the following year he acquired new glory by a victorious campaign through Servia and across the Balkan, which conquered peace from the Turks. Uladislas, however, was induced by the legate of Eugenius IV. to break it, and perished with the greater part of his army at the battle of Varna (1444). Hunyady, who escaped, was made governor of Hungary during the minority and absence of Ladislas the Posthumous, son of Albert, who was detained by the emperor Frederic III. The intrigues of various powerful lords, however, greatly disturbed this period (1446-'53). In 1448 Hunyady was defeated by Sultan Amurath at Kossova, on the confines of Servia and Bulgaria, but in 1454 he was again victorious over the enemies of his country and Christendom, whose expulsion from Europe he made the task of his life. The heroic and successful defence of Belgrade closed his career. Of his two sons, Ladislas died innocently on the scaffold, and Matthias (Corvinus) ascended the throne of Hungary.

HUPAZOLI, FRANCESCO, a Piedmontese centenarian, who lived in 3 centuries, born in Casale, March 15, 1587, died Jan. 27, 1702. His parents sent him to Rome to be educated, and obliged him to enter holy orders. He travelled in Greece and the Levant, and at Scio was married in 1625, and engaged in commerce. At 82 years of age he was appointed consul of Venice at Smyrna. His habits were regular; he drank no fermented liquors, ate little, and chiefly of game and fruits, never smoked, and went to bed and rose early. He was of a mild temper and exact in his religious observances, attended mass every morning, then walked for several hours, after which he applied himself to his correspondence, and gave the rest of his time to society. He was sick for the first time in 1701, when he had a fever which lasted 15 days, and he remained deaf for 3 months after his recovery. At the age of 112 years he had two new teeth, but lost all his teeth before his death, and lived on soup. At the age of 100 years his hair, beard, and eyebrows, which were white, became again black. He suffered in the last year of his life from the gravel, and died of a cold. He was 5 times married, and had 24 legitimate and 25 illegitimate children. By his 5th marriage, which took place in his 99th year, he had 4 children. He left in manuscript a full journal of the principal events of his life.

HURD, RICHARD, an English prelate, born in Congreve, Staffordshire, in 1720, died at Hartlebury in 1808. He was the son of a farmer of Staffordshire, and was educated at Cambridge, where he became a fellow of Emmanuel college

in 1742. In 1749 he published a commentary on the *Ars Poetica* of Horace, and while engaged upon this became intimate with Bishop Warburton, whose life he afterward wrote. He continued to reside at Cambridge till 1757, when he became rector of Thureaston. He was preacher to the society of Lincoln's Inn in 1765; archdeacon of Gloucester in 1767; bishop of Lichfield and Coventry in 1775; preceptor to the prince of Wales and the duke of York in 1776; and bishop of Worcester in 1781. In 1783 George III. offered him the archbishopric of Canterbury, but he declined it. A collection of his works, in 8 vols. 8vo., was published in London in 1811.

HURON. I. A N. co. of Ohio, drained by Huron and Vermilion rivers; area, 455 sq. m.; pop. in 1850, 26,203. It has a nearly level surface and an excellent sandy soil. The productions in 1850 were 666,416 bushels of Indian corn, 301,892 of wheat, 244,601 of oats, 31,433 tons of hay, 748,701 lbs. of butter, and 255,134 of wool. There were 15 grist mills, 57 saw mills, 9 iron founderies, 12 tanneries, 42 churches, 2 newspaper offices, and 7,380 pupils attending public schools. The Cleveland and Toledo, the Sandusky, Mansfield, and Newark, and the Cleveland, Columbus, and Cincinnati railroads pass through the county. Capital, Norwalk. II. An E. co. of the S. peninsula of Michigan, forming the extremity of a point of land between Lake Huron on the E. and N. E. and Saginaw bay on the N. W.; area, 850 sq. m.; pop. in 1850, 210. The surface is nearly level, watered by Pigeon, Willow, and Tappapoie rivers, and in some places marshy. Most of the county is covered with forests. It was yet unorganized at the date of the last census.

HURON, LAKE, one of the great lakes on the boundary between the United States and Canada. It receives at its N. extremity the waters discharged from Lake Superior by St. Mary's river or strait, and also those of Lake Michigan through the straits of Mackinaw. Its outlet at the S. extremity is the St. Clair river, the lake suddenly contracting into this stream in lat. 43° N. Its extreme N. limit is the E. end of the S. coast of the upper peninsula of Michigan in lat. 46°. Its boundary on the W. is the S. peninsula of Michigan, on the E. the Canadian coast and a group of islands belonging (except Drummond's, the most western) to Canada, which stretch around on its N. side, and partially separate the lake from the great bodies of water that are in fact but a part of it, though distinguished by the names of Georgian bay and Manitoulin bay. The whole width of Lake Huron, including Georgian bay, is estimated at about 190 m., and its length 252 m. Its area is computed to be about 21,000 sq. m. Its elevation above the sea is rated by the state engineers of Michigan at 578 feet; the Canadians make it 3 feet less. The level of its waters fluctuates several feet at irregular periods, as is observed also of the other lakes. Various estimates are made of its average depth, the least be-

ing 800 feet, and the highest, which is that of the Michigan state report of 1838, 1,000 feet. In this report it is stated that soundings have been made in the lake of 1,800 feet without finding bottom. Few harbors are found along the W. shore of Lake Huron. About 70 m. N. from the outlet Saginaw bay sets back into the land a distance of 60 m. toward the S. W., and under its islands and shores vessels find shelter from the storms which prevail from the N. E. or S. W. up and down its wide mouth and across the broadest expanse of the lake. Thunder bay is a much smaller extension of the lake into the land, about 150 m. from the outlet. Steamers usually stop here for supplies of wood, chiefly pine and birch, which, with the white pine largely cut for lumber, and excellent grindstones obtained from the sandstone rocks, constitute the only valuable products of these shores. At Presque Isle, 28 m. further N., is another harbor, where the land turns round toward the N. W., and a straight course is thence made for Mackinaw, 70 m. distant. This island is famous as a trading post and fort in the history of the N. W. and of the fur trade, and is still the chief point of importance on the lake. The harbor is deep and well sheltered, on the S. side of the island, under high hills, upon which stands the U. S. fort. The fishing business is extensively carried on, whitefish of excellent quality abounding in the lake near by, and those of the northern part of Lake Michigan also finding a market here.—The shores on the Michigan side present few features of interest. The rock formations are sandstones and limestones of the several groups from the Helderberg to the coal measures, the latter being found in the upper portion of Saginaw bay, where, however, they are of little importance. Beaches of sand alternate with others of limestone shingle, and the forests behind are often a tangled growth of cedar, fir, and spruce in impenetrable swamps, or a scrubby scattered growth upon a sandy soil. Calcareous strata of the upper silurian stretch along the E. coast from the outlet nearly to Georgian bay, and are succeeded by the lower members of the same series down to the Hudson river slates and the Trenton limestone, which last two stretch across from Lake Ontario to Georgian bay. In the metamorphic rocks found in the upper portions of Manitoulin bay copper ores begin to appear, and have been worked at the Bruce mines. With the change in the rock formations the surface becomes more broken and hilly, rising to elevations 600 feet or more above the lake.—The rivers that flow into Lake Huron, excepting the St. Mary's and the Francois, the outlet of Nipissing lake, are of little importance. Those on the Canadian side are noticed in the article CANADA, vol. iv. p. 330; and in the same article, p. 339, the railroad route recently opened between the head of Georgian bay and Lake Ontario is mentioned. By this road the distance between Buffalo and Mackinaw is reduced by about the whole length of Lake Erie, and the navigation of this lake

and of the chief portion of Lake Huron is saved by a passage across Lake Ontario, by railroad across the Canadian peninsula, and by steamboat through Georgian bay to Mackinaw. The Canadians have also a line of travel formerly much used by the canoes of the N. W. traders between Lake Huron and Montreal, by the François river, Nipissing lake, and the river Mattawa, into the Ottawa, the whole distance being about 400 m., instead of about 1,000 m. by the St. Lawrence and Lakes Ontario and Erie. The season of navigation in Lake Huron is usually from the last of April or early part of May into December; and the finest season, during which the waters often continue smooth and the air mild and hazy for 2 or 3 weeks, is the latter portion of November.

HURONS. See WYANDOTS.

HURRICANE, a violent storm of wind occasionally passing over a portion of the earth's surface; also called cyclone and tornado, the latter commonly designating a hurricane on land. Hurricanes prevail more particularly and with the greatest fury in the torrid zone, always however at some distance from the equator, which they never touch nor cross. They also occur in the temperate zones, either independently or proceeding from the torrid zone. In the polar regions they are unknown. These terrible commotions of the atmosphere are naturally objects of special interest to navigators, and to landsmen also of the regions where they prevail, whose lives and property they endanger. But though this interest has been felt from remote periods, little was known until the present century of the laws which control these phenomena, or of any means of foreseeing and guarding against their effects. They were looked upon as destructive currents of the atmosphere moving onward in a direct course, and exhibiting whirls and eddies analogous to those seen in impetuous torrents of water. No one was able to comprehend the whole phenomenon in one view, and trace out the storm from the time and place of its beginning to those in which it died away. Franklin first observed the tendency of the N. E. storms of the Atlantic coast to advance toward the point whence the prevailing wind comes, and he presented a greatly exaggerated estimate of 100 m. an hour as the average rate of this progress; but in his meteorological papers no evidence is found of his having a clearer conception of the nature of hurricanes than was generally possessed. In 1801 Col. Capper published a work on winds and monsoons, in which he advanced the opinion that the hurricanes at Pondicherry and Madras of 1760 and 1773 were of the nature of whirlwinds, whose diameters could not exceed 120 m.; that the velocity of the wind at any point was due to the rotary velocity of the vortex; and moreover, that the storm had a progressive motion. In 1820 Brandes, in his "History of the Weather in 1783," propounded a theory which was afterward advocated by Profs. Espy, Bache, and

others in the United States, that the currents of air in great storms flow in all directions toward a central point, which is a point of diminished pressure, having an onward motion over the surface. He urged this theory also in his *Dissertatio Physica de repentinis Variationibus in Pressione Atmosphære Observatis*, published in 1826, respecting a storm which passed over southern Europe in Dec. 1821. Prof. Dove opposed these views in a treatise on barometric minima, published in Poggendorff's *Annalen*, vol. xiii., 1828, and explained the phenomena on the assumption of one or more great rotary currents or whirlwinds moving from S. W. to N. E.; and in this paper he remarked that all the hurricanes that had come under his notice in the southern hemisphere rotated in an opposite direction to those in the northern. The cause of the rotation he attributed to the continual opposition which the winds, set in motion by any agency toward the poles, experience from masses of air either comparatively inert or like the trade winds moving in an opposite course, the effect of which must be to throw the winds in the northern hemisphere around in great whirls directed S. E. and N. W., or in the contrary direction to the movements of the hands of a watch placed face upward; and in the southern hemisphere in whirls turning with the hands of a watch. (See "American Journal of Science," vol. xlv., 1843, p. 328.) In April, 1831, Mr. William C. Redfield of New York published in the "American Journal of Science" the first of a remarkable series of papers upon the phenomena of storms, which was continued in many subsequent numbers of the same journal to the period of his death in Feb. 1857, and particularly in those of 1846. Entirely unacquainted with the opinions advanced by Col. Capper and with those of Prof. Dove, he presented in his first paper his observations, made in Sept. 1821, upon a hurricane which swept along the Atlantic coast and crossed the state of Connecticut, in which he then resided, and from this passed across Massachusetts. Soon after its occurrence he had occasion to follow a portion of its track, and his attention was forcibly directed to the evidences presented of the wind having blown toward different points at the same time in different places, and also in the same place at different times. Comparing together his observations, he was thoroughly persuaded that the storm was a progressive whirlwind; so he explained it at the time to his friends; and in the paper referred to he published his views in full, supporting them by details afterward collected of the same storm in its range further south, and of other great storms of the same character. The novelty of the views, and the clearness and ability with which they were sustained, drew the attention of scientific men to the subject. About that time Major Reid, afterward Gen. Sir William Reid, was employed by the British government at Barbados in restoring the buildings laid waste in the great hurricane of 1831, and was earnestly collecting

details respecting the West Indian hurricanes. The paper of Mr. Redfield came to his notice, and, as he states, "was the first he had met with which appeared to convey any just opinion on the subject of hurricanes." His observations confirmed this impression. In 1838 he published his first paper on hurricanes in "Professional Papers of the Royal Engineers," vol. ii.; not long afterward his work entitled "An Attempt to develop the Law of Storms by means of Facts, arranged according to Place and Time;" and in 1849 another work, entitled "The Progress of the Development of the Law of Storms and of the Variable Winds, with the Practical Application of the Subject to Navigation."—One of the most extensive, rapidly advancing, and destructive ocean hurricanes on record, which well exemplifies the range and immense areas swept over by hurricanes, was first observed at the Windward islands about Oct. 20, 1858. It passed over Porto Rico, Hayti, and the Bahamas; then recurving its axis, passed on the 24th nearly over Bermuda, where its violence was extraordinary; and thence, for some days following, it pursued its course to the N. E. almost or quite to the shores of Europe. No storm described by either Redfield or Reid seems to have had the enormous diameter of this. It was severely felt 700 m. eastward of Bermuda in the same latitude, while its western border grazed New York, affecting the barometer sensibly, and rolling in the extraordinary tides of Oct. 24 and 25. ("American Journal of Science," Jan. 1859, p. 155.) Most of the hurricanes of the Atlantic commence, like the one described, to the E. of the Windward islands, and proceed toward the W. N. W., sometimes reaching the coast of the United States, and almost invariably curving around in lat. 25° to 30° toward the N., and then toward the N. E., following after making the bend a course nearly parallel with the coast. Their path is thus an approximation to a parabolic curve, the apex of which is near lat. 30° . Of 15 hurricanes, the courses of which are delineated by Mr. Redfield in the chart accompanying his paper in the "Journal of Science" of Jan. 1846, 10 (all of the months of August and September) follow the general course given; of the others, those belonging to the tropics were traced only on their western course from the Windward islands through the gulf of Mexico, and two of October passed from Central America N. E. into the Atlantic, one reaching from Honduras across Cuba and beyond Newfoundland. This is traced more than 3,000 m., and is called by Mr. Redfield the Cuba hurricane. One of December is traced from Arkansas across New Jersey into the Atlantic; and one of November from Wisconsin through Lake Ontario into the gulf of St. Lawrence. The places of beginning and ending of these storms, some of which were traced from 2,500 to 3,000 m., were undetermined. They covered in some instances an area of more than 1,000 m. in width, while in the low latitudes they are usually limited to 100 or 150 m. Their progress was at vari-

able rates, from 4 to 44 m. an hour, commonly about 30 m. But the motion of rotation, as the great body of air moved forward, was much more rapid. It was found greater near the centre than in the outer whirls, and was estimated to reach a velocity of from 100 to 300 m. an hour. As the storm passes over any place lying near the centre of its track, the wind blowing from right to left across the direction pursued by the great body of the storm continues to increase in violence and the barometer to fall, till the latter sometimes reaches to about 28 inches at the level of the sea. A lull or calm then ensues for a short time, and the storm recommences with additional fury. But the wind now blows from the other direction, the axis of the spiral whirls having passed beyond the place. The change of wind is very sudden at points a little removed from the centre of the track, and, occurring on the inner whirls, where the wind rages with the utmost violence, the effects are most disastrous to vessels at sea in such positions. As the hurricane passes onward, the mariner, who may have been contending against its terrible power for days together, is first cheered by observing the rise of the barometer, and the subsiding of the torrents of rain which it poured down along its front; and if acquainted with its course, he so shapes his own as to pass in the shortest time through its outer whirls. It is indeed not now unusual for skilful seamen, who understand the laws of these storms and their general course, to foresee their approach, and avail themselves of the outer winds they bring along to waft them away from their track. But an inexperienced navigator may be carried around in their circuits as in a whirlpool; and once out of the storm, he may by a wrong course overtake it and again plunge into the dangers just escaped. Mr. Redfield cites the case of the clipper Charles Heddle, which, sailing from Mauritius to Muscat in the usual course of the hurricanes of the Indian ocean, was caught by one which was slowly advancing at the rate of less than 4 m. an hour, and was kept in it 117 hours, carried round and round at an estimated average distance of 45 m. from the axis of the gale, while the wind veered 5 complete revolutions. The whole distance sailed by log was 1,373 m., while that made on her course in the same time was only 354 m. The phenomena observed of the great hurricanes at sea are more uniform than of the smaller gales, and of those which occur upon land.—The season most subject to hurricanes in the Atlantic is in the months of August and September. Mr. A. Poey of Havana has found that 355 hurricanes which have been observed from 1493 to 1855 were distributed as follows: Jan., 5; Feb., 7; March, 11; April, 6; May, 5; June, 10; July, 42; Aug., 96; Sept., 80; Oct., 69; Nov., 17; Dec., 7.—The hurricanes of the southern hemisphere, and of the Indian ocean and China sea, have been studied particularly by Mr. Piddington and Gen. Reid, and by Dr. Thom, who has long resided at the island of

Mauritius. This island, and those of Bourbon and Rodrigues, lie directly in the track of the hurricanes that prevail in this part of the Indian ocean from December to April. Its inhabitants consequently take the greatest interest in these phenomena, making them, as stated by Commodore Perry, the chief topic of discussion in the season of their occurrence, talking of little else, and keeping meteorological instruments of every kind in use and under the most careful observation. Mr. Bosquet of the observatory at Mauritius claims to be able to predict the approach of a hurricane and describe the course it will take. The barometer is affected by an advance aerial wave, which causes it to stand higher than usual. The inequality of the atmospheric pressure causes its column to oscillate, and this effect has been noticed in the China sea 24 hours in advance of a typhoon. A heavy sea, too great for the prevailing weather, also indicates a coming gale. The hurricanes of the South Indian ocean are estimated to range from 150 to 600 m. in diameter; their rate of progress is remarkably slow, varying from $1\frac{1}{2}$ to 12 m. per hour. This slow progress tends to produce sudden shifts of wind with alternate lulls, as the successive whirls sweep several times over the same spot. In the southern hemisphere the recurvature in the track of the cyclones is about lat. 26° , being, as in the northern hemisphere, at the polar limit of the trade winds. The path is directed westward from the point of commencement of the storm near the equator, and, turning around in the latitude named, is then directed toward the S. E. The most dangerous quarter for a vessel to be overtaken by a southern typhoon is on the left side as it is advancing, the rotation being from the left to the right, and thus tending to draw the vessel into its track, while on the right side the wind would permit her easily keeping off. In the northern hemisphere, owing to the different direction of the rotation, the right hand is the dangerous side of the advancing storm. The cyclones of the Asiatic seas N. of the equator are equally terrific with those on the S. side. At the Ladrone islands, in long. 146° , they prevail in June, July, and August, and again in December and January. The inhabitants prepare for them by lashing down and securing their houses. In Sept. 1855, one occurred at the island of Guam, lat. $13^\circ 26' N.$, by which more than 8,000 persons were left without a roof to shelter them. The chief notices of the great gales in the bay of Bengal and the China sea are found in the works of Piddington. These accounts show a remarkable similarity in these gales to those of the Atlantic; the rate of progress, however, being generally much slower than of the gales on the coast of the United States.—It cannot fail to excite surprise that in the short time since we have learned the movements of the winds in hurricanes, we should have been able to turn this knowledge to such good account in saving lives and property. The most intelligent navigators gratefully recognize the benefits they

derive from the discoveries of Mr. Redfield and Gen. Reid. It seems reasonable to hope that the fruits of these are not yet all realized. The telegraph, as suggested by Mr. Redfield, is likely to prove a most valuable instrument in giving notice of the approach of a hurricane; and to the United States it will be more particularly valuable when extended to the West India islands.

HUSBAND AND WIFE. The laws which govern the marital relation, and determine the mutual rights and obligations of the parties, are among the most important of those which prevail in any community; and it may be regretted that in the United States they are, at this moment, less accurately determined and less ascertainable than any others of equal consequence. The reason is, that we received from England this portion of the common law, and have only of late years perceived its repugnance to reason and justice. We now know, and probably no one denies, that the feudal system, upon which the common law is founded, did not give to woman that place and those rights which she ought to have. It not only regarded husband and wife as one, but the husband as that one. The sentiment that the law needs vast change in this respect is proved to be universal by the fact that there is no one of our states in which it has not undergone great modification; and the difficulty in making the change in such a way that the essential character and inestimable good of the marriage relation may not be endangered or impaired, is proved by the great diversity in the provisions recently introduced, in the frequent changes among them, and in the very frequent expression of opinion that much harm has already been done. In the East, where society began, woman has always been regarded as a servant of her husband, as his property, and as his plaything; and man has always been held in absolute political subjection. In Greece there were republics and democracies, in name at least; and certainly that political tyranny which had prevailed among eastern nations was greatly lessened, and the domestic tyranny of the husband over the wife was modified about equally. But the liberty of Greece was the liberty of comparatively few who were the masters of many; and the most conspicuous of the women of Greece were those who, like Sappho and Aspasia, had indeed escaped from the *gynæceum*, but had not found a home. In Rome there was a wider spread and better protection of personal right, for even under the most despotic emperors municipal rights and privileges were generally preserved throughout the Roman world; and woman had also advanced so far, that the Roman matron has been since regarded as the type of female dignity and purity. But much was yet wanted. The feudal system, built upon the ruins of western Rome by the Teutonic nations, a new race, acknowledging the new influence of Christianity, made an immense advance, because it gave to every man, even the serf, a definite place and definite rights, and in theory at least knew nothing of unlimited

power; and to woman it gave the unspeakable advantage of Christian marriage. It introduced, probably as a means of remedying or of mitigating social mischiefs which it could not otherwise restrain, the spirit of chivalry, whose controlling principle was the sentiment of honor; and while this newly developed sentiment exerted a very wide and beneficial influence upon all the relations and all the departments of society, in nothing was it more useful than in the profound respect and tender care which it sought at least to inspire toward woman. It was under this feudal system that the law grew up which forms at this moment the basis of the law under which we live. It was by the gradual elevation of woman in social and domestic life, by the side of man as he rose toward the possession of political rights, that so much good was attained as exists in that law. That the law of husband and wife in the United States is in advance of any that has existed or now exists elsewhere, we are confident. The tendency of the law, however incomplete it may yet be, is to respect and secure the rights of woman in such wise as to preserve her influence and her happiness; and to make the relation of husband and wife not a form of servitude or the means of oppression, but the central origin of blessings which could spring from no other source, and may pervade the whole life of both sexes. As much the greater part of the common law is still in force with us, and whatever laws we have are but various modifications of that law, we purpose, first, to give a condensed view of the principles of the common law in its reference to the relation of husband and wife; and then to present a brief statement of the principal variations from this law in all the states of this Union. In this article we shall not treat of promises to marry, or of the contract of marriage, or of settlements or contracts in view of marriage, but shall present what we have to say on those subjects in the article MARRIAGE. Here we shall treat only of the effect of marriage on the property of a woman, and of the husband's liability for her debts contracted previous to marriage, and of her power to bind him by her contracts, and of his obligations for her, after marriage.—First, of the effect of marriage upon the property of a woman; for a single woman can possess almost every kind of property or interest which a man may, either real or personal. 1. A woman's real estate remains her own after marriage; but her husband acquires a right to it (or, in law language, an estate in it) for her life, and an estate in it for his own life as soon as a living child is born to them, by what is called tenancy by courtesy. He has therefore a life estate in her land either for her life, or for his own life; but when this life estate ceases, her rights, or the rights of her heirs, revive absolutely. He cannot transfer her land by his deed, nor can she by her deed; but in this country it may be transferred by the joint deed of the two. In different states different precautions are provided by law, to make it sure

that she executes such a deed of her own free will. Thus, she must, in many of the states, be examined apart from her husband, by some magistrate, as to her willingness and her motives for thus disposing of her land. On the other hand, by her marriage, she acquires an indefeasible right of dower to the use of one third of his lands during her own life, of which she cannot be divested but by her own act. In this country she usually releases her right of dower, when she wishes to do so, by adding her release to her husband's deed of the premises. But his creditors cannot generally get it in any way without her consent. (See DOWER.) 2. A woman's personal property in possession becomes absolutely the husband's property by marriage. By this is meant all the money in her hands, and all her chattels, as furniture, plate, pictures, books, jewels, &c. Nor can he by common law give to her either of these chattels or of his own during marriage, because transfer of possession is essential to a valid transfer by gift, and her possession is his possession in law. He however may give to her by his will what he chooses to, and may doubtless make a valid transfer of any thing in possession, as a gift *causa mortis*. (See GIFT.) The reason why the personal property of the wife is thus absolutely transferred to the husband may have been, in part, the lingering influence of the falsity which regarded the wife herself as only the property of the husband; but it was much more, probably, the comparative worthlessness of personal possessions in the feudal ages, when the common law began. Whatever were the reasons, they have little force or application at present. A single woman may, in general, make whatever contracts a man can. If by such a contract she acquires and receives into her own hands any property, it is property in possession, of which we have spoken. But if the thing which she purposes to obtain by the contract be money, or the right to dividends, or any other right, and it remains to be received or acquired after her marriage, she herself possesses not the thing, but a right to demand and receive the thing; and this right is a thing in action (usually called by the Norman French phrase, a *chose in action*), and not a thing in possession. This chose in action, belonging to the wife, passes by marriage to the husband, but not absolutely. What he acquires is the right to reduce it to possession, and thereby make it absolutely his own. But he is not obliged to reduce it to possession; and if he does not, and dies, the wife surviving him, all his right is gone, and the chose in action remains as absolutely the property of the widow as it would have been had she never married. The principal choses in action to which this rule applies are notes, bills of exchange, and evidences of debt generally, and scrip or stocks standing in her name. The principal ways of reducing it to his possession are four: by collecting and receiving the debt for his own use; making a new contract with the debtor, in his

own name, in substitution for her name; having the scrip or certificates or other evidences of debt transferred to himself and his own name; or suing the debt and recovering a judgment upon it. If she dies before him, and before he has reduced them to his own possession, he may now do so as her administrator, and then retain them for his own benefit as her next of kin. And it seems now that if he obtains possession of them and their proceeds, after her death, without taking out letters of administration, his title is perfect, and he need not take them out; but this is not certain. If he dies (having survived her) without having reduced them to possession, his next of kin may take out letters as her administrator, and reduce the choses in action to possession for his heirs. In regard to the wife's contracts against herself, *i. e.*, the debts she owes at the time of marriage, the general rule is that the husband is answerable for all of these. The creditor may demand payment of the husband; and may sue him. This is equally true of the debts which had matured and become due before marriage, and of those which were not payable until afterward; and his liability for her debts is the same, whether he receives much with her, or little, or nothing. But this liability is not absolute; for if she dies before he pays the debt, and before a judgment is recovered against him, his liability ceases. But if she leaves choses in action not reduced to the husband's possession, these are still liable for her debts, and the husband, or whoever becomes her administrator, must apply them to pay these debts, and retain only the surplus for the husband or his next of kin. If he dies before he pays her debts, and before judgment is rendered against him, his estate is not liable, but the wife's liability, which was suspended during his life, revives at his death. This is true although he received a large property with her. Thus, if a single woman owes \$50,000, and has \$25,000 in her hands, and as much more in notes or other choses in action, and her husband takes her money, and reduces her choses in action to his own possession, and dies before he can be compelled to pay the debts, and gives his personal property by will to others (which he may do), all her liability revives, while all her means are gone, and her creditors have no way of reaching any part of what was her property. On one point there is irreconcilable conflict among the American authorities. All admit that the husband may reduce his wife's choses in action for his own benefit; but can he transfer to another person the right to collect them for that person's own benefit? So, if, before reducing them to possession himself, he becomes insolvent, can his assignees or creditors collect these choses in action against his will, and apply them to the payment of his debts? There is high authority for the doctrine that the husband's right over his wife's choses in action is a purely marital right, which he cannot transfer to another to exercise excepting as his agent,

and which his assignees do not acquire by his insolvency nor his creditors by attachment, and which he cannot be made to exercise himself, except at his own pleasure. But the prevailing authority and practice of the country seem to be in favor not only of the husband's own power to transfer his mere right (regarding this transfer, especially if for value, as a reduction to possession by the husband), but of the principle that the right itself is a vested pecuniary right, which his creditors may acquire and exercise, by due process of law, against his will. But courts having equity powers do, in some cases, interfere in favor of the wife, and compel the creditors to make some provision for her.

3. We will now consider the contracts or obligations of the wife made or entered into during marriage. In the first place, a married woman has, at common law, no power whatever to make a valid contract which shall bind herself or her husband. If money is due for her services, or for money lent by her, it is due, not to her, but to him. Her time and her labor and her money are all his. But she may act as his agent in making a contract, and, if authorized by him, he is bound. This authority may be express, or it may be implied from frequent acts of agency recognized by him, as when she acts as his clerk, accepting or paying bills, &c.; and then it does not differ in law from a common agency. There is, however, an important and peculiar agency of the wife, growing out of her duties; and this is an implied agency for the husband in all domestic matters, as the hiring of servants, and the purchase of provisions and of clothing for the family. As this grows out of necessity, it is measured by it; but the law means a reasonable necessity, and this is only an appropriateness. For any contract of this sort made by her, which is in due conformity with the husband's means, station, and manner of life, would bind him, and he would not be permitted to deny his authority. If they exceeded this necessity or appropriateness, the husband could be held only on some evidence of authority or assent, as that he knew the contract, or saw the things bought, and made no objection. The question then occurs, How far is the husband bound to supply the necessities of the wife? The general rule on this subject is, that he is bound to supply her with all necessaries, which means in this case all her reasonable wants, while they live together. If they separate because he drives her away without sufficient cause, the same liability continues; and then he is responsible for any debts she may contract for this purpose. Even Lord Eldon declared that "where a man turns his wife out of doors, he sends with her credit for her reasonable expenses." (3 Espinasse, 250.) There can hardly be a sufficient cause for thus casting her off without his liability for her subsistence, unless it be her adultery; but this certainly is sufficient. If, however, she voluntarily leaves him, she cannot carry his credit with her, unless she leaves with sufficient cause.

It has been held in England that cruel treatment, confinement in her chamber under pretence of her insanity, and taking a mistress into his house, were not sufficient cause; and that if the wife then escaped and fled, the husband was not liable for necessities supplied to her. (3 Taunton, 421.) But this case has been disapproved in England, and it was declared in New York that such doctrine cannot be law in a Christian country. (4 Denio, 46.) While the law is now pretty well settled, both in England and in this country, as to when the husband is liable for necessities furnished to the wife, and when he is not, a question of much moment remains, and of late years has been much considered, viz.: On what ground does this liability rest? It must rest upon his authority as proved, or as implied by law; or else upon his marital duty as husband. If it stands upon the former foundation, it must follow that he may always prevent his liability by express refusal and prohibition; or, in other words, that he always has the power to limit or prevent his liability. If it stands on the foundation of his marital duty, this he is bound to discharge, and his prohibitions are of no effect. The former was the unquestionable rule in England and here until very recently, no other ground for the husband's liability being recognized in any way than his authority express or implied; and therefore it was held, that if a wife lived with her husband, no one could recover from him the price of any necessities supplied to her, under any circumstances, against his prohibition. Thus, Chief Justice Hale said (1 Siderfin, 109): "The law will not presume so much ill, as that a husband should not provide for his wife's necessities." At length, however, it began to be seen that there might be cases of incapacity, as where the husband was wholly insane, and could not be supposed to constitute an agent or confer authority upon any one; and yet it could not be supposed that the wife was to be deprived of the necessities of life which her husband's means were amply sufficient for, because he could not authorize the purchase of them. Again, we have seen that the husband who drives his wife abroad sends his credit with her; but the absurdity of supposing that he constitutes her his agent struck the court. Baron Alderson said (Read vs. Legard, 6 Exch. 636): "It is a monstrous proposition that a man who drives a woman out of doors, who hates, who abominates her, actually gives her authority to make contracts for him." In that case the principle was recognized, that the right of a wife to a proper support grows out of the marital relation, and that the liability of the husband for necessities supplied to her is a consequence of that right. This case was so decided in 1851; but in 1834 the same doctrine had been held in Massachusetts (16 Pickering, 198), and it has been adopted and confirmed in New York (1 Sandford's Sup. Court Rep. 483), and may now be considered as the settled law of the country. It must be remembered, however, that there is

an essential difference between the case where husband and wife cohabit, and that where they live apart. In the first, the presumption of law is strong against the husband; and he can resist payment for supplies furnished only by showing that they were not necessities, either because they were unreasonable and inappropriate in kind or in amount, or that the wife was sufficiently supplied elsewhere. But if she have separated from him, no such presumption exists. Whoever supplies the wife now, takes upon himself the risk of being able to show that she needed what he gave her, and that there was no such sufficient cause for the husband's withdrawing his support of her as would destroy his liability for what was furnished to her.—As to the separation of husband and wife by mutual consent, the law has always regarded it as a kind of voluntary divorce, and has formerly refused to admit or acknowledge it in any way. Of late years, however, in England certainly, and perhaps here, it seems to be otherwise. It is still a rule of the common law that husband and wife cannot contract with each other, because they are not two persons, but one. Hence no bargain which they can make directly with each other has any force or effect at law. But if they make their bargain through and by means of a third person, by way of trustee, and enter into certain covenants with him, a court of equity, and for some purposes a court of law, would permit this trustee to maintain such actions as might be necessary to give full effect to the bargain, although its only purpose were to provide for the separation of the parties. There are, however, two qualifications to this rule. One is, that if the court see that the terms of separation are catching, oppressive, or unreasonable, they will not carry them into effect. The other is, that the *locus penitentiae* is always kept open. Although the bargain provides that the separation shall be perpetual, and all its terms are founded upon this supposition, and are clothed for this purpose in the most stringent language, yet, as soon as either party wishes the separation to cease, it must cease. The husband cannot deprive himself of his right to recall his wife; and she cannot deprive herself of her right to return. By the "custom of London," a married woman may be a sole trader there, but nowhere else in England. In the United States, partly by statute and partly by adjudication, a married woman would generally be permitted to carry on business on her own account, much as a single woman might, in case of continued abandonment, or long imprisonment of the husband, or alienage and non-residence, or with the knowledge and consent of the husband, which might be inferred from circumstances. It should be added, that the husband is liable for the wife's wrong doings (or torts and trespasses, as the law calls them) in many cases; as for her libel, slander, fraud, cheating, and generally for injurious misconduct. If she commit a crime in his presence, the law presumes that he ordered it; but he

may remove this presumption by evidence of its falsity.—We shall now proceed to present the principal changes in the common law as to husband and wife, made by statute in the several states, up to the present time, as far as we have been able to learn them. Provisions of this kind are sometimes inserted in laws of which the title and general purpose are wholly different; and in this or in some similar way some may have escaped our notice. In Maine a married woman holds as her separate property whatever was hers before marriage, or comes to her in good faith during marriage, and her property only is liable for her debts; and marriage makes her of full age although under 21. In New Hampshire, after 3 months of desertion, or any cause for divorce, she becomes a single woman as to all rights of acquiring, holding, and disposing of property; and the will of a wife passes all her property, saving the husband's tenancy by the courtesy, and excepting that her devise or bequest to him is void. In Vermont the superior court may authorize a married woman to dispose of her property in case of desertion; and her will passes property as in New Hampshire. In Massachusetts the laws are complicated; but in general, a married woman deserted by her husband has the rights of a single woman; and contracts made for her benefit are valid without the intervention of a trustee, and she may make a will with the husband's assent, or for some purposes by the authority of the supreme court, or without any assent or authority. In Rhode Island the provisions of law are substantially similar to those in Massachusetts. In Connecticut the property held by or coming to her is secured to her own use, the husband for some purposes being her trustee, and he may be required to give bonds; and if he abandons her, property coming to her is absolutely hers. In New York all her property, whenever acquired, may be held and disposed of by her, for her own use, and this alone is liable for her debts; and an action may be maintained between her and her husband. In New Jersey the law of husband and wife is much as in New York; but the wife cannot dispose of real estate by will, and if she does not dispose of her personal estate her husband may administer and retain it. In Pennsylvania a wife whose husband is at sea has the rights of a single woman; all her property is her own, and is liable for her debts, and her husband is not liable; she may dispose of it by will, but he retains his tenancy by the courtesy. In Delaware there is an express provision that the widow of one whose will was made before marriage takes the same share as if he were intestate. In Maryland the common law is not changed in any important particulars. So also in Virginia. In North Carolina there are some particular provisions, but they do not vary her rights materially. In South Carolina the principal change is an enlargement of her rights and obligations as sole trader. In Georgia the real estate of the wife is put on the same

footing as the personal estate; it is said to vest absolutely in the husband, but his power of disposing of it without her assent is much restrained; he is liable for debts only as far as her property goes. In Florida the wife's property is secured to her, and is alone liable for her debts; and at her death he takes the same interest as a child, and if there be no child he takes the whole; but she may dispose of it by a will. In Alabama her property is secured to her, and is alone liable for her debts. In Mississippi her property is secured to her, but, as it seems, less perfectly; her husband is said not to be liable for her ante-nuptial debts until her separate property is exhausted, nor for her post-nuptial debts if she has a separate estate; and she cannot make a will. In Louisiana her rights and obligations are peculiar; we cannot give within a reasonable space even a condensed statement of them; it is enough to say that they are founded on the rules of the civil law, as that is now modified wherever it prevails, and these rules we think more reasonable than those of the common law. In Texas her property is secured to her; but property acquired by either, and not by gift, devise, or descent, during marriage, is common to them; if there are no children, the survivor of the two takes the whole, but the husband may dispose of it during his life. In Arkansas her property may be held by her in her own right, and yet it would seem that the wife's personal property is liable for the husband's debts contracted after marriage; she cannot make a will unless empowered by settlement or by her husband. In Tennessee the principal change from the common law makes her property acquired during separation not liable for his debts, unless she lives with him again. In Kentucky it is difficult to state the general effect of the peculiar provisions; but her property is substantially secured to her (the husband having the use of it during marriage), and is alone liable for her debts. In Ohio her property cannot be taken for the debts of the husband, excepting her choses in action reduced to possession by him. In Michigan, a woman acquires by desertion of the husband the rights of a single woman; her property is secured to her, but she cannot dispose of it without her husband's consent; she may however devise it. In Indiana, the principal change limits the husband's liability for her debts to the amount of her property. In Illinois the common law is not materially changed. In Missouri her property is not liable for the ante-nuptial debts of her husband; and his property acquired before marriage in any way, or after marriage by descent, gift, grant, or devise, is liable for her ante-nuptial debts; she cannot make a will unless empowered by settlement or by her husband. In Iowa, the law as to her personal estate is peculiar and intricate, and amounts to an imperfect security of it for her benefit; the property of neither party is liable for the debts of the other; by desertion she acquires the rights of a single woman; tenancy by the courtesy is abolished, and the husband

has the same right of dower in the wife's property that she has in his; she may receive gifts or grants from him without the intervention of a trustee. In Wisconsin the property of the wife is all secured to her. In California the law of husband and wife is minutely provided for by statutes which leave little of the common law in force. All the property of either party at marriage, and all subsequently acquired by gift, descent, bequest, or devise, is the separate property of that party; all property subsequently acquired by either party otherwise is the common property of both. He has the management and control of her separate property, but cannot alienate it without her consent; he has the absolute disposition of the common property and of his own separate property; dower and courtesy are abolished; upon the death of either party, the common property is divided between the survivor and the heirs of the deceased, and this latter half is chargeable with the debts of the deceased; her separate property only is liable for her ante-nuptial debts; they may control these provisions by marriage contract; she may make a will with the written consent of her husband; she may carry on trade as a single person, upon complying with certain requirements, and her husband is not liable for her debts contracted in such trading, without his special written promise.

HUSBANDS, HERMAN, an American patriot, born in Pennsylvania, died near Philadelphia about 1794. Removing to Orange co., N. C., he became a member of the legislature and leader of the "regulators," a party which was organized in 1768 for the forcible redress of public grievances. He published in 1770 a full account of the rise of the troubles. A battle took place in 1771 between Gov. Tryon with 1,100 men and 2,000 of the insurgents on the banks of the Alamance, in which the latter were defeated. Husbands escaped to Pennsylvania, where he was concerned in the whiskey insurrection in 1794, and was associated with Albert Gallatin, Breckinridge, and others, as a committee of safety.

HUSKISSON, WILLIAM, an English statesman, born at Birch-Moreton, Worcestershire, March 11, 1770, died at Eccles, Lancashire, Sept. 15, 1830. He was originally intended for the medical profession, and in his 14th year went to Paris to pursue his studies. During a residence there of several years his mind became thoroughly imbued with revolutionary doctrines; and he carried his enthusiasm so far as to join the *société de 1789*, from which however he withdrew in 1790, when his views underwent a change. In 1792 he returned to England with the British ambassador, Lord Gower, whose private secretary he had become, and having made the acquaintance of Pitt, Dundas, and other influential men, received in 1795 the appointment of under secretary of state in the departments of war and the colonies under Mr. Dundas. He soon evinced so great a capacity for business that he was frequently consulted by

Pitt on public matters. In 1796 he entered parliament, of which, with the exception of two years, from 1802 to 1804, he remained a member until his death. Following the fortunes of Mr. Pitt, he retired from office with him in 1801, and became secretary of the treasury on the formation of the new Pitt ministry in 1804. In the same manner he attached himself to Mr. Canning, taking office with him in 1807 and retiring in 1809. He entered the cabinet in 1823 as president of the board of trade and treasurer of the navy, which offices he retained until the death of Mr. Canning. In the Goderich cabinet and in that of the duke of Wellington he held the office of secretary of the colonies; in which position he remained until May, 1828, when the redemption of a pledge formerly given obliged him to vote against his colleagues, and he resigned. As a public man he was chiefly known by his speeches on financial and commercial subjects. In 1810, as a member of the bullion committee, he recommended the resumption of specie payments by the bank of England, and the suppression of bank notes under the value of £5. He is regarded as the great pioneer in the free trade movement, although he was far from advocating the doctrines of the modern free traders in their fulness. In 1823 he carried through parliament an act for removing various restrictions upon commerce, including a number of duties which had been imposed for the protection of home produce. It made him the object of much abuse from interested parties; but he defended his measures with ability, and his speeches on the subject are among the best he ever delivered. He was also active in procuring the repeal of the combination laws, and the relaxation of the restrictions on the exportation of machinery. Mr. Huskisson left London on Sept. 15, 1830, to be present at the opening of the Liverpool and Manchester railway; and at Parkside, while conversing with the duke of Wellington, was accidentally run over by a locomotive, and died the same evening.

HUSS, JOHN, a Bohemian religious reformer, born July 6, 1373, burned as a heretic at Constance, July 6, 1415. His surname was derived from his place of birth, the small town of Hussinetz, on the border of Bavaria. His lineage was not noble, yet he was enabled to pursue liberal studies, at first in his own town, then in Prasalitz, and finally in the university of Prague, where he was graduated in 1393. In 1398 he began to give lectures in philosophy and theology; in 1401 he became president of the university faculty of theology; and in 1402 he was installed preacher in the Bethlehem chapel, which had been established 10 years earlier for the purpose of enabling the people to hear preaching and the Scriptures in the Bohemian tongue. He became the confessor and friend of the queen, the adviser of the archbishop, and the head of a party of young priests and scholars who meditated alike reforms in discipline and in doctrine. The close relations of the English and Bohemian monarchies, as of the

universities of Oxford and Prague, had brought the latter city into acquaintance with the views of Wycliffe, and Huss was not slow to embrace them. His first polemical treatise, *De Sanguine Christi Glorificato*, was occasioned by the pilgrimages to Wilsnack to see and worship the miraculous blood of Christ there shown on the consecrated host. In successive sermons preached before the archbishop, Huss next arraigned the misconduct of the clergy even in high places; demanded the despoiling of the churches of useless ornaments, that the poor might be fed and clothed; and called upon the secular officers to hinder and punish the open vices of ecclesiastics. This bold severity excited strong opposition, which was greatly increased when the ordinance of Charles IV., giving special privileges to the native over the foreign students, was removed by Huss, and the enraged Poles and Germans deserted the university, depriving the city of thousands of its population; soon after which he became rector of the university. If this act of Huss made the native students more proud of their champion, it brought upon him the ill will of the tradesmen and the ecclesiastics, whose revenues were by this means curtailed. Other circumstances, connected with the papal schism, aided to embroil Huss with the archbishop and his friends. It became a warfare between the university and the cathedral. The pope interfered for the latter; and, fortified by his bull, at the close of the year 1409, the archbishop Sbynek burned 200 volumes of the works of Wycliffe, which had been deposited in his palace. Against this act Huss protested, in a spirited treatise addressed to the new pope, John XXIII., with arguments of such weight that a commission of doctors condemned the archbishop for irregular action. Especially in this treatise does Huss insist upon the right of the people to have spiritual instruction, and to use even the works of unbelievers if their own faith remain unharmed. The cry of heresy was now raised against Huss, and he was summoned to Rome to answer this charge. The court, the university, and even the archbishop sent a defence of his orthodoxy, and Huss sent advocates to plead his cause before the cardinals, but they were not heard. He was condemned as a heretic, and ordered to quit Prague; and the city was placed under ban so long as he should remain there. Finding it vain to resist, and not yet prepared for an open warfare with Rome, he yielded to the interdiction and left the city. But his retirement only inflamed the zeal of his partisans. The books which he wrote at this period, half apologetic, half polemic, tended more and more to widen the breach and to arouse acts of violence. The first words of the treatise *De Libris Hæreticorum Legendis* are: "We ought to read and not to burn the books of heretics, if there is possibly any truth in them." Protesting his orthodoxy, Huss vindicates reason and Scripture as the best and highest grounds of faith. He is not afraid to defend Wycliffe, so far as Wycliffe has spoken truth; and he is willing to go to the stake in defence

of what he believes to be truth. He is ready to be a martyr. Such views were incendiary. An outbreak in the city followed; the partisans of Huss were victorious, the archbishop fled, and the heretic came back to his chapel, emboldened to preach more vehemently against prevalent corruptions. He praised the king for upholding the cause of truth and purity against the mandates of ecclesiastical power; and in his treatise *Contra Occultum Adversarium*, written at this time, he maintains the doctrine that kings have the right to rule the clergy not less than the laity. Scarcely had this commotion been quieted by the death of Sbynek in 1411 and the appointment of the new archbishop Albic, when a more serious trouble arose. The pope had issued bulls of excommunication against King Ladislas of Naples. Political reasons induced the court and university to side with the pope; but Huss immediately published 2 tracts against the papal bulls. A reaction followed. The partisans of the pope were insulted in the streets, and Huss had great difficulty in restraining the fury of his followers. This blow against ecclesiastical supremacy was followed by another, in tracts which maintained that the clergy were not owners but only stewards of the wealth in their possession, which belonged to the people and not to the church. Huss now denounced auricular confession, the veneration of images, prayers to the saints and the Virgin, and prayers for the dead; maintained that not the priest's word, but the power of God, wrought the change of transubstantiation; claimed that any one moved by the Spirit had the right to preach; and asserted the right of conscience as against the edicts of popes and councils. Many of his former friends in the university now left him, and some became resolute adversaries. He was again summoned to Rome, but took no heed of the order, and only preached more zealously. He attended as chaplain the burial of 3 young artisans of Prague, who were executed for resisting the royal edicts, and celebrated their death as a martyrdom. Repeated attempts were made by the king to compose the difficulties and to moderate the zeal of the reformer, but without success. A decree was procured from Rome, putting Huss again under ban as an incorrigible heretic, and requiring all the parish priests of Prague to denounce him. The archbishop Albic, unequal to the crisis, retired, and left to his successor, Conrad of Vechta, the task of enforcing the interdiction. Huss thought it best, at the earnest request of the king, to leave Prague for a time, and found shelter in his native town, contenting himself with sending tracts and placards to be hung on the door of his Bethlehem chapel. In a long treatise upon "The Church," he holds that the papacy began to exist at the time of Constantine, and that its usurpations threatened to secularize and so to destroy the gospel. Frequent letters and occasional secret visits confirmed the zeal of his partisans. He continued to preach in the cities to immense crowds; and

after a time, to be nearer Prague, he removed his residence to the castle of Cracowitz, which had been offered him as a refuge. Prudence could not restrain the bitterness of his invective, and the numerous treatises and sermons which came from his pen at this period are all marked by the same sarcastic and fiery indignation. In 1414, at the instigation of the emperor Sigismund, John XXIII. summoned a general council at Constance to consider and heal the numerous troubles under which the church was laboring. Huss was cited to appear, and trusting to the safe-conduct which the emperor granted him, against the advice of friends, resolved to obey and defend his cause in person. On Oct. 11 he set out upon his journey, travelling on horseback, escorted by 4 knights, his friends, and was every where received with enthusiasm. In all the places through which he passed, he gave notice that he was ready to answer questions and explain his views. Parish priests assured him of their sympathy; at Nuremberg he held a long interview with the merchants, and left them friendly to his opinions. On his arrival at Constance he was welcomed by the pope with a fraternal greeting. "If John Huss had killed my own brother," said the pope, "I would hinder with all my power the least injustice to him during his stay in Constance." He promised even to suspend the former interdict. Two days after his arrival the council opened; but it was not until Nov. 16 that the first regular session was held. Up to this time, and for some weeks longer, Huss was free to come and go, to discuss and preach, and had begun to gain confidence. Expecting a special trial, he had prepared his defence. But his enemies dreaded the effect of this personal appearance; they placarded the streets with the name of Huss as an excommunicated heretic; they circulated the report that he was intending to escape; and their manœuvres so far succeeded, that on Nov. 28 they caused the arrest of the heretic, his imprisonment in the cathedral, and his transfer to the Dominican convent, on an island in the lake, some 8 days later. An accusation in 8 articles against Huss had been drawn up, and 3 commissioners were appointed by the pope to visit him in prison, question him, take down his answers, and report to a council of doctors. Huss asked, but was not allowed, the assistance of counsel. His private letters were opened, his appeals to the emperor disregarded, and the kind treatment of his prison keepers could hardly compensate for the injustice of his enemies. The flight of the pope, instead of relieving him, only aggravated his suffering. He was transferred to the strong castle of Gottleben, heavily chained. A new commission was appointed to examine and decide in his affair, and at the beginning of June, 1415, he was removed to the Franciscan convent in Constance. On June 5 he had his first hearing before the council, which had already at a previous session condemned the heresy of Wycliffe. The attempt of Huss to answer the first

article of accusation was met by such a storm of outcries, insults, and sarcasms, that he was unable to proceed; and the hearing was adjourned until the 7th, when it was renewed in presence of the emperor. He was accused of denying transubstantiation; of treating St. Gregory as a buffoon; of teaching in Bohemia the doctrines of Wycliffe; of encouraging his friends to resist the mandates of the archbishop; of exciting a schism of the state from the church; of appealing from the pope to Christ; of counselling the people to violent and aggressive measures; and of boasting that he could not have been forced either by pope or emperor to come to Constance, unless he had chosen to come. Some of these charges he frankly admitted; some he denied. A third hearing was allowed him on the next day, when 39 articles, extracted from 3 of his works, were presented and read, touching various points of his free teaching concerning the church, its officers and sacraments. Huss was then summoned to retract these heresies, which he declined to do, affirming that he could not retract what he had never said, nor ought he to retract what he had said until its falsity was shown. The threats and entreaties of the emperor were as powerless to move him as the subtleties of the cardinal of Cambrai, who was spokesman for the doctors. Abundant promises of favor were made to him if he would consent to recant; an ingenious formula was drawn up which might enable him to overcome his scruples; friendly visits and visits of warning were made to him in his cell; but no influences could shake his resolution. On June 24 the books of Huss were condemned to be burned as heretical. On July 1 a new deputation came from the council, and on the 5th another from the emperor; but though respectfully listened to, they could obtain no satisfaction. On July 6 he was brought before the council to receive sentence. The place of assembly was densely crowded. After a discourse by the bishop of Lodi, from the text, "that the body of sin be destroyed," the 39 articles were read, together with the sentence of condemnation of the books of Huss, and finally the sentence of himself, to be degraded from the priesthood as an incorrigible heretic, and given over to the secular arm. He was then conducted out of the city to an open field, in which a stake and a pile of wood had been erected. Here he was again summoned to abjure his heresies, but at the summons he only knelt and prayed, using the words of the psalms of David. As the fire was kindled, he began to sing with a loud voice the *Christe eleison*, "Jesus, have mercy," and only ceased when he was suffocated by the rising flame. When the fire had ceased, the ashes of the pile were gathered and cast into the Rhine; all traces of the event were carefully obliterated, and to this day the exact spot remains uncertain.—The writings of Huss are of 4 kinds, dogmatic and controversial, exegetical, sermons, and epistles. Of the first class, there are 27 separate treatises, beside fragments,

which treat of the blood of Christ, the priesthood, indulgences, the veneration of images, and all the points at issue in that age concerning ecclesiastical doctrine or practice. Of the class of exegetical writings, there are 5 treatises, on the acts of Christ, the passion of Christ, a commentary on 7 chapters of the 1st Epistle to the Corinthians, and notes on other canonical epistles, and an explanation of 10 of the psalms. In the class of sermons there are 38, two of which were written at Constance, but never preached. There are two series of letters, the first of 14, written before, and the second of 56, written after his departure from Prague to Constance. The complete works of Huss were published in quarto at Strasbourg in 1525.—The Hussites, or followers of Huss in Bohemia, immediately made the offering of the cup to the laity in the sacrament of the eucharist the badge of their covenant. Upon the death of Wenceslas (1419), they refused to recognize the emperor Sigismund as king, whereupon the Hussite civil war broke out. They were divided into two parties, the more moderate Calixtines and the more rigid Taborites. Ziska, the leader of the latter party, assembled them on Mt. Tabor, captured Prague, pillaged the monasteries, and in several engagements defeated Sigismund. After the death of Ziska (1424), his place was filled by a monk named Procopius, who defeated the mercenaries sent under the name of crusaders by the emperor and the papal legates in the battles of Mies (1427) and Tachau (1431), and whose troops ravaged Austria, Franconia, Saxony, Catholic Bohemia, Lusatia, and Silesia. A council held at Basel in 1433 made concessions which were accepted by the Calixtines. The Taborites, rejecting the compromise, were vanquished in the battle of Prague (1434), and by the treaty of Iglau (1436) the compromise of Basel was accepted by Bohemia, and Sigismund was recognized as king. On the death of Sigismund (1437) controversies again arose, and civil wars were prosecuted with no decisive results, till at the diet of Kuttenberg (1485) a peace was established by King Ladislas which secured the Catholic and Calixtine parties in the possessions which they then held.—See Schubert, *Geschichte des Hussitenkriegs* (1825).

HUSSARS (Hung. *húsz*, 20, and *ár*, rate), the national cavalry of Hungary and Croatia. The name is also applied to some bodies of light cavalry in the armies of other countries of Europe. It is derived from the fact that in the 15th century every 20 houses in Hungary were required to furnish a soldier with a horse and furniture. The arms of the hussars are a sabre, a carbine, and pistols. Their regimentals were originally a fur cap with a feather, a doublet, a pair of breeches to which the stockings were attached, and a pair of red or yellow boots. There were 5 regiments of hussars under Tilly at Leipsic in 1631. The name first became general in the 18th century, when regiments of hussars were organized in the principal European armies.

HUSTINGS (Sax. *hus-tyng*, house of trial), the name of an ancient court granted to the city of London by Edward the Confessor, in 1052. It is the supreme court of judicature of the city, held annually before the mayor and common council. Winchester, York, Lincoln, and some other old English cities, have had similar courts. The name is now applied to the booths wherein parliamentary elections are conducted.

HUSTON, LORENZO DOW, D.D., an American clergyman, born in Cincinnati, Ohio, Feb. 24, 1820. He was educated at Woodford college; entered the Ohio conference of the Methodist Episcopal church in Sept. 1839; was transferred to the Kentucky conference in 1842; was elected by the general conference of the M. E. church, South, editor of the "Home Circle" and of the "Sunday School Visitor" in May, 1854, and reelected in 1858. He received the degree of D.D. from Emory college, Ga., in 1856.

HUTCHESON, FRANCIS, the founder of the Scottish school of speculative philosophy, born in Ireland, Aug. 8, 1694, died in Glasgow in 1747. He studied theology at Glasgow, and became pastor of a Presbyterian congregation in the synod of Ulster. His first work, an "Inquiry into the Original of our Ideas of Beauty and Virtue" (1720), gave him distinction among philosophers, and gained for him the friendship of Archbishop King of Dublin. In 1728 he published a treatise on the "Nature and Conduct of the Passions and Affections," and in the following year was appointed professor of moral philosophy in the university of Glasgow, from which he received the degree of doctor of laws. His *Synopsis Metaphysicæ Ontologiam et Pneumatologiam complectens*, and his *Philosophiæ Moralis Institutio*, were written as text books for his classes. His most complete and elaborate work, the "System of Moral Philosophy," appeared after his death (2 vols., Glasgow, 1755), with an interesting biography by Dr. William Leechman. His writings are marked by purity of style, copiousness of illustration, and an amiable tone of feeling, and exerted a more general influence than the severe and profounder compositions of his contemporary Bishop Butler, with whom he coincided in his most important principles. Following in the path of Shaftesbury, he maintained that beside the 5 external senses we possess also internal senses, one of which occasions the emotions of beauty and sublimity and introduces us to the realm of aesthetics, and another gives rise to the moral feelings. He introduced the term moral sense, which had been once employed by Shaftesbury, and has continued to be a part of philosophical language. This suggestion of an inward source of ideas was the first step taken by the Scotch philosophy against the increasing materialism of the school of Locke. He also maintained the existence of certain metaphysical axioms or universal propositions, which are derived not from experience, but from the connate power of the mind (*menti congenita intelligendi vis*). Benevolent sentiments and acts he regarded as

the only objects of moral approbation, and denied that prudence, as long as its end was the profit of the agent, could be accounted virtuous.

HUTCHINSON, ANNE, the founder of the Antinomian party in the New England colonies, died in Westchester co., N. Y., in Aug. 1643. She was the daughter of a Lincolnshire clergyman. In England she was interested in no preaching but that of John Cotton and her brother-in-law John Wheelwright, and it was her desire to enjoy the ministry of the former which induced her to follow him to New England. She arrived in Boston with her husband, Sept. 18, 1634, was admitted a member of the Boston church, Nov. 2, and rapidly acquired esteem and influence. She instituted meetings of the women of the church to discuss sermons and doctrines, in which, with a ready wit, bold spirit, and imposing familiarity with Scripture, she gave prominence to peculiar speculations which even on her voyage had attracted the attention and caused the displeasure of her fellow passengers. Such were the tenets that the person of the Holy Spirit dwells in every believer, and that the inward revelations of the Spirit, the conscious judgments of the mind, are of paramount authority. She had been two years in the country before the strife between her supporters and her opponents broke out into public action. Among her partisans were the young governor Vane, Cotton, Wheelwright, and the whole Boston church with the exception of 5 members, one of whom was the associate pastor Wilson, while the country clergy and churches were generally united against her. Wilson was censured by the church for a speech which he delivered on the subject in a meeting of magistrates and elders. Soon after (1637) Wheelwright was censured by the general court for a sermon in maintenance of his opinions which was pronounced seditious, but the governor protected him, and the Boston church petitioned against the proceeding. "The dispute," says Bancroft, "infused its spirit into every thing; it interfered with the levy of troops for the Pequot war; it influenced the respect shown to the magistrates, the distribution of town lots, the assessment of rates; and at last the continued existence of the two opposing parties was considered inconsistent with the public peace." The peculiar tenets of Mrs. Hutchinson were among the 82 opinions condemned as erroneous by the ecclesiastical synod at Newtown, Aug. 30, 1637; and in November she was summoned before the general court, and after a trial of two days was sentenced with some of her associates to banishment from the territory of Massachusetts, but was allowed to remain during the winter at a private house in Roxbury. It was her first intention to remove to the banks of the Piscataqua, but changing her plan she joined the larger number of her friends, who, led by John Clarke and William Coddington, had been welcomed by Roger Williams to his vicinity, and had obtained through his influence from the chief of the Narragansetts

the island of Aquetneck, subsequently called Rhode island. There a body politic was formed on democratic principles, in which no one was to be "accounted a delinquent for doctrine." The church in Boston, from which she had been excommunicated, vainly sent a deputation of "four men of a lovely and winning spirit" to the island with the hope of reclaiming her. After the death of her husband in 1642, she removed with her surviving family into the territory of the Dutch, probably from apprehensions that Rhode island might not be a safe place of refuge from the encroachments of Massachusetts. The precise locality where she settled has been a matter of dispute, but according to the latest authorities it was near Hell Gate, Westchester co., N. Y. The Indians and the Dutch were then at war, and in an invasion of the settlement by the former her house was attacked and set on fire, and herself and all her family, excepting one child who was carried captive, perished either by the flames or by the weapons of the savages.

HUTCHINSON, JOHN, a Puritan colonel in the parliamentary service during the civil war in England, born in Nottinghamshire in 1617, died in Sandown castle, Kent, Sept. 11, 1664. He was a man of family and of good education, and was married at Richmond, July 3, 1638, to Lucy, daughter of Sir Allen Apsley, governor of the tower of London, with whom he subsequently settled on his estate at Owthorpe. Being of a religious turn of mind, he devoted much time to the study of divinity, from which his attention was soon diverted by the serious political questions which agitated the kingdom. A careful investigation of the matters at issue between the king and the parliament satisfied him of the justice of the latter's cause, and after the commencement of the civil war he declared for the parliament and was appointed governor of Nottingham castle, which he held until the close of the war. He afterward represented Nottingham in parliament, and, as a member of the high court of judiciary appointed for the trial of the king, concurred in the sentence pronounced on him, having first "addressed himself to God by prayer." The subsequent course of Cromwell, however, met with the disapproval of Hutchinson, who was one of the few honest and consistent republicans among the public men of England. At the restoration he was comprehended in the general act of amnesty, but was subsequently arrested on a suspicion of treasonable conspiracy, and after a detention of 10 months in the tower was removed to Sandown castle, where he died of an aguish fever brought on by confinement in a damp cell.—LUCY APSLEY, wife of the preceding, born in the tower of London, of which her father was at the time governor, Feb. 9, 1620, died in the latter part of the 17th century. She survived her husband many years, and left a memoir of him, dictated by affectionate admiration of her subject, and valuable as a record of events, and as presenting many striking por-

traits of public men, although too strongly biassed by her husband's political views to be considered an impartial record. One of its most interesting features is the insight it gives into the domestic life of the Puritan gentry, the authoress being, in the opinion of Professor Smyth, "often a painter of manners as minute and far more forcible than even Clarendon." According to the same authority: "She will be thought to have united the opposite virtues of the sexes, and to have been alike fitted to give a charm to existence amid the tranquillity of domestic life, and in an hour of trial to add enterprise and strength to the courage of a hero." Her work was first published from the original manuscript in 1806 (4to., London), under the editorial supervision of the Rev. Julius Hutchinson, a descendant. Several other editions have since appeared, the last being that published in "Bohn's Standard Library" in 1846.

HUTCHINSON, JOHN, an English philosopher, founder of a mystical school of philosophy and theology, born in Spennithorne, Yorkshire, in 1674, died Aug. 28, 1737. After receiving a careful private education, he served as steward in several noble families. As riding purveyor of the duke of Somerset, then master of the horse, he availed himself of his excellent opportunities for the study of natural history, and made a large collection of fossils. In 1724 appeared the first part of his "Moses's Principia," in which he disputed the Newtonian theory of gravitation. In the second part (1727) he continued his criticisms of Newton, and maintained on biblical authority the doctrine of a *plenum* in opposition to that of a *vacuum*. From this time one or more of his uncouthly written volumes, containing a sort of cabalistic interpretation of the Hebrew Scriptures, appeared annually. His leading idea is that the Scriptures contain the elements of all rational philosophy as well as of general religion. The Hebrew language has not only its literal but its typical sense, every root of it being significant of hidden meanings. With this elastic principle of exegesis he deduces a system from which the occult powers of attraction, gravitation, magnetism, and electricity are excluded, but according to which the whole mechanism of the heavens is the result of the agency of fire, light, and spirit, the 3 material elements which were set to work in the beginning, and which typify the 3 persons of the Trinity. His views found numerous followers, among the more eminent of whom were President Forbes, Bishops Horne and Horsley, Jones of Nayland, Parkhurst the lexicographer, Robert Spearman, Julius Bates, Lee, Hodges, Wetherell, and Holloway. His philosophical and theological works were published in London in 13 vols. (1749-'65).

HUTCHINSON, THOMAS, governor of the province of Massachusetts, born in Boston, Sept. 9, 1711, died at Brompton, near London, in June, 1780. He was the son of a merchant of Boston who was long a member of the council, and he was graduated at Harvard college in

1727. After engaging without success in commerce, he began the study of law with reference to public life. He represented Boston for 10 years in the general court, of which he was for 3 years speaker. He became judge of probate in 1752, was a councillor from 1749 to 1766, lieutenant-governor from 1758 to 1771, and was appointed chief justice in 1760, thus holding 4 high offices at one time. In the disputes which led to the revolution he sided with the British government. His brother-in-law, Andrew Oliver, was appointed distributor of stamps under the law which was to go into effect Nov. 1, 1765, but was compelled by mobs to resign the office before that time. The mansion of Hutchinson was also twice attacked in consequence of a report that he had written letters in favor of the act, and on the second occasion (Aug. 26), when the rioters were maddened by liquor, his house was sacked, the furniture burned in bonfires in the street, and many manuscripts relating to the history of the province, which he had been 30 years in collecting and which could not be replaced, were lost. The inhabitants of the town on the following day in public meeting voted their abhorrence of the proceedings; but though many of the actors were well known, no one was punished. He, however, received compensation for his losses. In 1767 he took a seat in the council, claiming it *ex officio* as lieutenant-governor; but both the house and council resisted his pretension, and he abandoned it. The legislature was inclined to restore him to the council in 1768, until it was announced by his opponent James Otis that he received an annual pension of £200 from the crown. When in 1769 Gov. Bernard was transferred to Virginia, the government of Massachusetts fell to Hutchinson. The popular excitement had already been increased by the arrival of British troops, and after the Boston massacre a committee of citizens, headed by Samuel Adams, forced him to consent to the removal of the regiments. He received his commission as governor in 1771, and his whole administration was characterized by duplicity and an avaricious love of money, writing letters which he never sent, but which he showed as evidence of his zeal for the liberties of the province, while he advised the establishment of a citadel in Boston, the stationing of a fleet in its harbor, the proclamation of martial law, and the transportation of "incendiaries" to England. In 1772 Dr. Franklin, then in London, procured some of his confidential letters, which were forwarded to Massachusetts, and ultimately communicated to the legislature in secret session. They proved that he had been for years opposing every part of the colonial constitution, and urging measures to enforce the supremacy of parliament; and the result was a petition to the king from the assembly and the council praying for his removal from the government. The last of his public difficulties was when the people of Boston and the neighboring towns determined to

resist the taxation on teas consigned by the East India company, two of the consignees being sons of Gov. Hutchinson. The popular committees were resolved that the tea should not be landed, but should be reshipped to London. A meeting of several thousand men, the most numerous ever held in Boston (Dec. 14, 1773), demanded the return of the ships, but the governor refused a pass. The consequence was that on that evening between 40 and 50 men disguised as Indians repaired to the wharf, and emptied 340 chests of tea, the whole quantity that had been imported, into the bay. In the following February the governor sent a message to the legislature that he had obtained his majesty's leave to return to England, and he sailed on June 1. The privy council investigated his official acts, and decided in favor of "his honor, integrity, and conduct," which decision was approved by the king. He was rewarded with a pension. He published the following valuable works: the "History of the Colony of Massachusetts Bay, from the First Settlement thereof in 1628 until the Year 1750" (2 vols., 1760-'67); a "Brief State of the Claim of the Colonies" (1764); and a "Collection of Original Papers relative to the History of the Colony of Massachusetts Bay" (1769). From his manuscripts a volume treating the history of Massachusetts from 1749 to 1774 was prepared by his grandson, the Rev. John H. Hutchinson, of Trentham, England (London, 1828).

HUTTEN, ULRICH vox, a German scholar and reformer, born in the castle of Steckelberg, Hesse-Cassel, April 20 or 22, 1488, died in Switzerland, Aug. 29, 1523. When 11 years old he was placed in the monastery of Fulda, that he might there become a monk; but when only 15 he ran away from the cloister to the university of Erfurt, where he became intimate with such men as Crotus Rubianus and Eobanus Hesse, Temonius, and many others who were zealously pursuing ancient literature and forming a vigorous opposition to the regular monkish party, which viewed with disfavor studies which were in fact often carried so far as to apparently threaten a revival of heathenism. Here he was supported by his friends and relations. A disease then new to Europe raged in many places, and when it appeared in the summer of 1505 in Erfurt both students and teachers took to flight. Among the former were Hutten and his friend Crotus. It was still deemed necessary for an educated man to be familiar with the scholastic philosophy, and Hutten accordingly studied industriously at Cologne the writings of Thomas Aquinas and Duns Scotus. This city was the stronghold of the old system, led by the since notorious Ortwein or Ortuinus Gratius, Jacobus Hoogstraten, Arnoldus Tugern, their friend Pfefferkorn, and all who were then termed *Dunkelmänner* or "Obscurants." Here, in the head-quarters of monkish peculiarities, Hutten collected rich material for the strongly characterized, biting sketches of the *Epistolæ Obscurorum Virorum*. Even in Co-

logne, however, the new spirit of classic study had found a home under the care of Johannes Rhagius, generally known as Rhagius Æsticampianus, who, encouraged by Count Nuenaar, endeavored to form a taste for the works of classical antiquity and what was then termed poetry, a word limited by the Obscurants to pure and ancient Greek and Latin metrical composition. Hutten became his friend and scholar, and, when he was driven away by the dominant party under the accusation of corrupting both youth and theology, followed him to Frankfort-on-the-Oder, where a new university dedicated to liberal studies was opened April 27, 1506. Among the eminent men here he found an old friend, Eitelwolf von Stein, who had been instrumental as privy counsellor in inducing the margrave of Brandenburg to found the university, and who at once took him under his care. At the inauguration Hutten published his first poem, *Carmen in Laudem Marchia*, in praise of the mark of Brandenburg. Here he received the degree of M.A., and remained till 1508. The disease which had driven him from Erfurt again seized on him, and in despair he sought health in long, aimless travel. In northern Germany he was everywhere warmly received, but was wrecked on the Baltic and reduced to great poverty. In this condition he went to the university of Greifswalde, and took lodgings with the burgomaster Wedeg Löt, a rapacious and cruel wretch, who in some way drove him from the town. While flying, the son and servants of Löt, having laid in wait, caught him, beat him cruelly, and robbed him of all his money and papers, even stripping him naked. In this condition, diseased and wounded, he came to Rostock, where he was well received. Here he wrote a famous satire on Löt (*Klagen gegen Löt*), calling on all the scholars of the new school in Germany to avenge him. In Rostock he lectured on the classics, established intimate relations with the professors, and worked for the interests of the classic school. His work against Löt soon spread over Germany, and his friends learned from it what had become of him. Crotus Rubianus, now teacher of Latin at Fulda, informed him that his father, who had never forgiven him since he ran away from Fulda, was at heart glad to hear of his growing reputation. "Sometimes he admits that you would have made a bad monk, and then hints a wish that you would study law in Italy." But Hutten could not bring himself to break off his vagabond life. In 1511 he went to Wittenberg, where he published his *Ars Versificatoria*, regarded in its day as a masterpiece. Thence he wandered, literally at times as a beggar, through Bohemia and Moravia to Vienna. Yet he met with some friends, one of whom, Bishop Stanislas of Turzo, gave him a horse and money. At Vienna he found another patron in Vadian, and here for a time he appears to have been prosperous and courted. Finally arriving at Pavia in April, 1512, Hutten resolved to study law in order to be reconciled

with his father. But 3 months later the city was besieged, and Hutten, who had taken part in the contest, believed himself in danger of death, and wrote his famous epitaph. Plundered of all he possessed by the Swiss troops of the emperor Maximilian, he fled to Bologna. Here his malady returned, and, repulsed by every one, badly treated, and starving, he enlisted as a soldier in the emperor's army. The results of his Italian studies were embodied in the elegant satire of *Ovris* (*Nemo*), in which the subjugation of Germany to Italy was closely criticized, and a decided inclination shown toward the reformers. In 1514, worn out by wretchedness, he left the army and returned to Germany. He was in but indifferent condition to seek to be reconciled to his family; his literary reputation was in those days an effectual barrier to church preferment, and he was identified with the party out of power. An accident now, however, led him to the very height of popular fame. Duke Ulrich of Würtemberg had fallen in love with the wife of his cousin Johann von Hutten, and murdered the husband. All Germany sent forth a cry of indignation at the outrage; "the murderer's own defence," says Gervinus, "condemned instead of exculpating him." When Hutten heard of this he was travelling, but his indignation went beyond bounds, and without waiting for a more fitting place he wrote on horseback his "Deplorations," in which he cried for vengeance. He availed himself of this deed to call on German towns to free themselves from ducal tyranny. "He so pointed out to the Germans the tyrant, that he became a by-word." The orations themselves obtained for Hutten the renown of a Demosthenes. But a short time elapsed before Hutten found himself in a new quarrel, ardently defending Reuchlin, who as a scholar was protesting against the wholesale destruction of all Hebrew books for which the Cologne Obscurants were clamoring. With the aid of many friends he published the celebrated *Epistola Obscurorum Virorum*, a work which aided the reformation more than any other one writing; and previous to this his *Triumphus Capnionis*, a vigorous book, whose publication was long delayed by the scruples of "the prudent Erasmus." In Oct. 1515, Hutten went again to Italy to study law and regain the favor of his family; but at Rome, having vanquished in fight single-handed 5 Frenchmen, one of whom he slew, he fled to Bologna, which he was soon obliged to quit for a somewhat similar cause, having taken part in a battle between Italian and German students. He visited Ferrara and Venice, but, having published satires against those in power, found it advisable to take refuge in Germany. At Augsburg he was presented by the celebrated Conrad Peutinger to the emperor, who gave him in public the spurs of knighthood, while Constance Peutinger, said to have been the most beautiful girl in Germany, crowned him with laurel. He was then sent by the elector of Mentz on a mission to

Paris, where he established intimate relations with the learned. Retiring to his family castle of Steckelberg, Hutten, having written by way of introduction several epigrams on Pope Julius II., edited the work of Laurentius Valla, entitled *De Falso Credita et Ementita Donatione Constantini Magni* (1517). This daring book caused a great sensation; Luther himself spoke of it in 1520 in high terms. In 1518 he found a protector in Albert, margrave of Brandenburg, whom he invited in a glowing panegyric to place himself at the head of united Germany. In the same year he accompanied the margrave to the diet of Augsburg, where Luther was to reply to Cajetan. But "Hutten, now the brilliant knight, troubled himself but little as to the poor Augustinian monk;" he was full of a project for uniting the princes of Europe against the Turks, and was fascinated with the idea of becoming an influential statesman. The work in which he preached this crusade he printed himself at Steckelberg in 1519, entitling it, *Ad Principes Germaniae, ut Bellum Turcis invehant Exhortatoria*. In it he upbraids the court of Rome and the German nobility. These latter had been previously more fiercely attacked in his "Dialogue of the Court Enemy," in which Hutten boldly assumes a tone like that of modern republicanism. In 1519 he left the margrave to join Franz von Sickingen in the Swabian league against his old enemy Ulrich of Würtemberg. Yet during this war he wrote the "Triad," "the most vehement thing which had hitherto been written against Rome," published his treatise *De Guaiaci Medicina et Morbo Gallico*, and edited two books of Livy, hitherto unpublished. The war over, he retired to the castle of Sickingen, whence he sent forth the bitterest attacks on Rome. He discovered in the library of Fulda a manifesto of Henry IV. against Gregory VII., and turned its German sentiment to such account that Leo X. demanded him as a prisoner. Driven from his castle by persecution, he took refuge in Ebernburg, whence he again sent forth bold writings addressed even to common soldiers. He now began to write, in prose and verse, in German, and these tracts are among his most daring productions. For a short time he fought in the army of Charles V. at the siege of Metz; and at this time Francis I. offered him the place of councillor at his court with 200 florins a year. Hutten never wandered to Switzerland, and Æcolampadius led him to Basel, where he hoped for support from Erasmus, who however turned against him, and even took pains to set the council of Zürich against him. Finally Zwingli obtained for him an asylum in the house of the clergyman Schnegg on the island of Unau in the lake of Zürich. Here, "worn out by war and suffering, he ended, in view of the Alps, a life which had been so short, so tumultuous, and so full of generous aspirations." Among his other works are: *Dialogi, Fortuna, Febris* (including the *Trias*, Mentz, 1520), and his poems (Frankfort, 1538). His collected works were publish-

ed by E. J. H. Münch (Berlin, 1821-'7). An *Index Bibliographicus Huttenianus* was published by Böcking at Leipsic in 1858, and a new edition of his works in 7 vols. in 1859. Among the most recent and best lives of Ulrich von Hutten is that by Strauss (Leipsic, 1857).

HUTTON, CHARLES, an English mathematician, born in Newcastle-on-Tyne, Aug. 14, 1737, died Jan. 27, 1823. He received but an indifferent education, and acquired his knowledge of mathematics without the aid of an instructor. At the age of 18 he became an usher in the village of Jesmond, and some years later the master of the school. In 1760 he removed to Newcastle, where, while teaching, he wrote his "Practical Treatise on Arithmetic and Book-Keeping" (1764). His "Treatise on Mensuration" (1771), and "Principles of Bridges, and the Mathematical Demonstration of the Laws of Arches" (1772), attracted much attention, and led to his being chosen in 1773 professor of mathematics in the royal military academy of Woolwich. He was elected fellow of the royal society, Nov. 10, 1774, and was foreign secretary of that body from 1779 to 1783, when he resigned, owing to an unjust charge that he neglected his duties. While connected with the royal society, Hutton published a large number of papers in its "Transactions," and made all the mathematical calculations for Maskelyne's experiments for determining the mean density of the earth. About 1795 he undertook, aided by Drs. Pearson and Shaw, the labor of abridging the "Philosophical Transactions." The work was completed in 1809, Hutton receiving £6,000 for his share in it. Being compelled by bad health to resign his professorship at Woolwich, he received from the board of ordnance a retiring pension of £500. His principal works, in addition to those above mentioned, are: "Tables of the Product and Powers of Numbers" (London, 1781); "Mathematical Tables" (1785); "Course of Mathematics" (3 vols., 1793); "Mathematical and Philosophical Dictionary" (1795). He was also for many years editor of the "Ladies' Diary."

HUTTON, JAMES, M.D., a British natural philosopher, born in Edinburgh, June 3, 1726, died March 26, 1797. He entered the university of Edinburgh in 1740, and began the study of law, which he subsequently abandoned for medicine, attending the requisite classes for 6 years in Edinburgh, Paris, and Leyden, where he took the degree of M.D. in Sept. 1749. He then engaged in the manufacture of sal ammoniac from coal soot, which was carried on in Edinburgh for many years with considerable success. Having inherited from his father a small estate in Berwickshire, he next betook himself to agriculture. He finally removed to his native city in 1768, where he devoted himself exclusively to scientific pursuits, especially the study of geology, and while thus engaged made several important discoveries. In 1795 he published the results of 30 years' study in his "Theory of the Earth," in which he assumes that

heat is the principal agent of the great operations of nature. Later researches in geology have strongly confirmed many of Hutton's views.

HUXLEY, THOMAS HENRY, an English naturalist, born about 1800. He was educated for the medical profession, and applied himself to the study of natural history, became an assistant surgeon in the naval service, accompanied Capt. Stanley's expedition to the eastern archipelago, and made observations on the natural history of the sea, particularly on the anatomy and affinities of the medusa and mollusca, on which subjects he has written extensively. He succeeded Prof. Edward Forbes in the chair of palæontology in the government school of mines, in connection with which he delivers an annual course of lectures on general natural history. He is also Fullerian professor of physiology at the royal institution. He has recently published a large work with illustrations, entitled "A History of the Oceanic Hydrozoa."

HUYGHENS, CHRISTIAN, a Dutch astronomer, born at the Hague, April 14, 1629, died there, July 8, 1695. His father instructed him till he was 15. From 1645 to 1648 he studied the mathematics and civil law at Leyden and Breda. His first work, *Theoremata de Quadratura Hyperboles, Ellipsis, et Circuli*, published in 1651, attracted the attention of Descartes and all the mathematical scholars of France. This was soon followed by *De Circuli Magnitudine Inventa Nova* (1654). In 1655 he went to France, and received the degree of LL.D. from the Protestant faculty of Angers. On his return he turned his attention to the construction of lenses for telescopes. Assisted by his brother, he succeeded in making one with a focal distance of about 10 feet. With this instrument, more powerful than any that had been used before, Huyghens discovered the 1st, now called from its position the 4th, satellite of Saturn. He also first gave a scientific explanation of the ring of that planet. Galileo had said that Saturn was sometimes attended by two globes, one on each side, having no relative motion, and at regular periods entirely disappearing and leaving the planet single. Huyghens discovered that these appearances arose from the broad ring of Saturn being seen obliquely from the earth. In 1656 he published a work on the calculus of probabilities, afterward translated into Latin by Schooten, his instructor in geometry, and reprinted in his *Exercitationes Mathematicæ* under the title of *De Ratiociniis in Ludo Aleæ*. In 1657 he constructed an instrument to measure time accurately by applying the pendulum to clockwork. His first pendulum clock he presented to the states-general of Holland, and asked a patent for his invention. He discovered the solution of the problem of finding the centre of oscillation of a compound pendulum, or the length of a simple one vibrating in the same time with it, without which solution no conclusion concerning the pendulum could be applied to those clocks in which the pendulums were necessarily com-

pound. In his *Horologium Oscillatorium* (Paris, 1673) there is a full account of his cycloidal pendulum, an interesting treatise on the properties of the cycloid, and a paper *De Motu Corporum ex Percussione*. During the years 1655-'63 he made several journeys to France and England. In 1666 he went again to France, and received at this time a pension from Louis XIV., who also assigned him a room in his library. He stayed in Paris about 15 years, and after some absence returned there again, and wrote many papers, some of which are still in manuscript in the archives of the institute. At the revocation of the edict of Nantes, however, being a Protestant, he left France, and even declined to keep up his correspondence with the academy of sciences, writing only for the royal society of London, of which also he was a member. In 1689 he went to England, principally with a view to make the acquaintance of Newton. In 1695 he lost his mind, so that he had only occasionally lucid moments. To almost all the physical sciences, to mechanics, optics, and astronomy, Huyghens contributed some valuable discovery or some interesting contrivance. The glasses of his telescopes were all made and polished by himself, and he used the most powerful instruments of his time. He was the first to discover the nebulous spots in the sword of Orion and in the constellation of Andromeda in 1656. He also was the first to adapt the telescope to the measurement of small angles, converting it in fact into the instrument since called a micrometer. In his *Systema Saturninum* he gives a full account of the discovery and mechanism of this instrument. In his *Traité de la lumière* (Leyden, 1690) he describes a new theory of light, which has since been more fully developed under the name of the undulatory theory. The ingenuity of this theory does not appear so much in the general view, as in his application of it to explain the equality of the angles of incidence and reflection, and the constant ratio subsisting between the sines of the angles of incidence and of refraction, and also the phenomena of double refraction. His investigations on double refraction led him to the important discovery of the polarization of light. His writings were very numerous, and were most of them contributions to the royal society of London, and the academy of sciences in Paris. The most complete edition of his works is that of 'S Gravesande (Leyden, 1724; Amsterdam, 1728).

HYACINTH (*hyacinthus orientalis*, Linn.), a flower of numerous varieties, and all of great beauty and fragrance. The hyacinth is of oriental origin. To the Dutch is conceded the merit of improving its qualities; and probably they were first acquainted with it in the beginning of the 16th century. About 1700 some 7 or 8 varieties were known in England. Miller in 1720 says that the Haarlem florists had above 2,000 varieties, and their bulbs formed a most valuable branch of commerce. The hyacinth grows readily from the seeds; they are sown in

October, after they have ripened, or in the following March. The new plants usually flower in about 6 years from the time of sowing. The hyacinth as seen in cultivation is of two sorts, viz., single and double flowered. The single hyacinth is preferable in many respects, as it flowers earlier, and its blossoms or bells are sweeter scented and more regular in shape. The double hyacinths greatly vary in size and multiplicity of petals, and some are in this respect of extraordinary beauty. Their cultivation is simple and easy, requiring essentially a soil of sandy loam and vegetable mould 2 feet deep; the bulbs should be planted early enough in October to insure a good supply of fibrous roots before the winter; the beds thus prepared and planted should be protected with leaves, which are to be carefully taken away in the spring when the plants issue from the earth. Some sort of protection from the rain and sun is well, as very warm weather in May is apt to injure the blooming. The hyacinth does well too in the parlor; and the bulbs, placed in large deep pots in good soil in November and kept cool in the cellar until the next February, will blossom finely when brought into the light and warmth. Such bulbs are of little value, however, for another season's use. When used for flowering in water, the water should be kept fresh and pure in the bulb glasses; and when the bulbs are first inserted, the glass should be put in some cool, dark place to promote the growth of the fibrous roots, without a strong supply of which the blossoms are worthless. This process, however, is so unnatural that the plant is destroyed at the end of flowering. It will be found preferable to select the earliest and single kinds for such purposes, as they always do better than the double sorts. A good hyacinth, according to the florist's idea, is one having a strong, tall, and erect stem, supporting numerous flowers in such a manner that the whole may have a compact pyramidal form, with the crown or uppermost flower perfectly erect; the flowers should be large and perfectly double, appearing to the eye rather convex in the centre; the colors should be clear and bright, whether plain red, white, or blue, or variously intermixed and diversified. Strong bright colors are in general preferred. The usual colors of the hyacinth are blue, both pale and dark, red, rosy, crimson, straw-colored or yellowish, called golden, and pure white. There is as great a difference in the readiness with which they flower as there is in the beauty, grace, or even splendor of their blossoms. In cultivating the several varieties, it is well to consult the different floricultural treatises in which their several merits are set forth.

HYACINTHUS, in Greek mythology, son of the Spartan king Amyclas and Diomedes, or of Pierus and Clio, or of Cebalus and Eurotas. He was a boy of great beauty and the favorite of Apollo, but was also beloved by Zephyrus, who from jealousy caused his death as he was playing with Apollo, by blowing the quoit of the

god against his head. Apollo changed him into the flower hyacinth, upon whose leaves appear the Greek exclamation of woe, AI, AI, or the letter Y, beginning his name ('Yakubos').

HYADES, in Greek mythology, nymphs variously described as being from 2 to 7 in number, and bearing 18 names. According to some authorities, Jupiter placed them among the stars in honor of their care of the infant Bacchus; while others say it was to reward them for their long mourning for their brother Hyas, who had been killed by a wild boar.

HYÆNA, a digitigrade carnivorous mammal, most numerous in Africa, but found also in southern and middle Asia, where the genus has probably spread while following the track of armies and caravans. Zoologists are not agreed as to the position of this animal; the older authors place it in the feline family, with which it agrees in the single true molar on each side of both jaws, and in the single tuberculate tooth on each side of the upper jaw only; Waterhouse regarded it as a small divergent group of *viverrina* or civet cats; Linnæus ranked it in his genus *canis*; and Hamilton Smith puts it in juxtaposition to the dogs. It seems to be an osculant type, united on the one hand to the dogs by the genus *lycaon*, and on the other to the civets by the genus *proteles* (aard-wolf); its general aspect is decidedly canine, as also are most of its habits. The dental formula, according to Owen, is: incisors $\frac{6}{6}$, canines $\frac{2}{2}$, premolars, $\frac{4}{4}$, and molars $\frac{1}{1}$, 24 in all. The disposition of the hyæna is fierce and cowardly, and its habits revolting; it is able to withstand any temperatures and privations, revels in the foulest air, and gorges on the filthiest substances when living prey fails; of powerful form, thick skin, and strong jaws and teeth, the bands of hyænas fear not the lion and tiger, and will attack even man in the night time. Its appearance is very repulsive; the head is large and truncated, the neck short and stout, the body thick and short, high at the shoulders and declining rapidly toward the tail, a long stiff mane from the nape to the rump, and a short tail; the gait is clumsy, the voice harsh and frightful, the expression of the face malignant, and its body offensive from its carrion food and the strong odor of its anal pouch. The feet are all 4-toed, with strong non-retractile claws fitted for digging, the dorsals and the pairs of ribs 15 or 16, and the lumbar vertebræ 4 or 5; the tibia and fibula are much shorter than the radius and ulna; the tongue is covered with horny papillæ, the irides elliptical above and circular below, the erect ears long and pointed, and mammae 4. The prevailing color is a dismal ochrey gray, with dark stripes and spots. The hyæna is among mammals what the vulture is among birds, the scavenger of the wilderness, the woods, and the shore, and useful in this way in disposing of carcasses which otherwise would pollute the air; often it attacks cattle and disabled animals, prowls in the rear of the larger carnivora, whose leavings it de-

vours, and digs up when possible the dead bodies of man and beast; from this last undisputed habit, the hyæna has been regarded as a horrible and mysterious creature, and is the subject of many superstitious fears and beliefs among the Semitic races. Its teeth are so powerful that they can crack the bones of an ox with ease, and their grip is tenacious to the last degree; were its speed great and its courage equal to its strength, it would be among the most dangerous of the carnivora; it sometimes burrows in the earth or hides in caverns, but generally passes the day in the desert, insensible to the scorching sun. The spotted hyæna (*H. crocuta*, Erxl.) is the most dog-like of the genus; it is about 4½ feet long from nose to base of tail, the latter measuring about 18 inches, and the head about 12; the height at the shoulders is 2½ feet; the general color is a dingy whitish gray, with small round brown spots, the muzzle as far as the eyes and lower limbs sooty, and the tail dark; the mane is rather short. It is found in South Africa, and on the coasts of Senegal and Guinea, and with the next species is generally called wolf by the Dutch colonists. It is fierce but cowardly, and will sometimes approach camps and make severe gashes on the limbs and faces of persons asleep; it is said sometimes to drag off children, which from its strength it could easily do; from the resemblance of its voice to a human laugh, it has received the name of the laughing hyæna; it rarely burrows, but occupies the retreats of other animals, prowling about at night. The striped hyæna (*H. vulgaris*, Desm., or *H. striata*, Zimm.), a rather larger animal, is found in Africa, Asia Minor, Arabia, and Persia; the head is wider, the muzzle fuller, and the eyes further from the nose, than in the preceding species; the hair is coarse and thick, of a dirty gray color, with transverse dark stripes on the sides and limbs; there is a stiff mane along the back; the habits are the same as those of the spotted hyæna. There are some varieties of smaller size, and one with a skin almost naked, in the Nubian deserts. The brown hyæna, or strand wolf of the Dutch colonists (*H. brunnea*, Thunb.), is only 4 feet long to the end of the tail, and a little over 2 feet high at the shoulders; the hair is long and shaggy, of a dirty yellow color, with tawny tints on the back and irregular stripes on the sides; it is less in size than the other species, and less destructive to the cattle of the colonists. The hyænas act very much the part of the wolf of northern climates, being equally fierce, cowardly except at night and when in packs, and annoying to the herdsman by their destruction of sheep and oxen.—There are in Africa certain dog-like animals, the *wilde honden* of the Dutch, and constituting the genus *lycaon* (Brooks), which seem to connect the dogs with the hyænas, and which are believed by Hamilton Smith to be partly the progenitors of the mastiff races; the head is short and truncated, the mouth broad, the teeth strong and dog-like; the ears

erect and large; neck long, body short, the limbs slender and highest before; tail short, hanging down, and inflexible; 4 toes on all the feet; pupils round; mammae 8 or 10. They hunt in packs, being swift, active, hardy, with excellent scent and acute sight; they do not burrow. They are found in Africa south of the great desert, and in Arabia and as far as the Indus in Asia. The hunting hyæna (*Iycaon venaticus*, Burch.) of the Cape is about as tall as a large greyhound, with long legs; the color is ochrey, white on the breast, with spots of the same edged with black on the neck, shoulders, loins, and croup, with wavy black streaks on the sides; the muzzle and cheeks black, the color passing up on the nape and down on the throat. It hunts in packs both by day and night, frequently destroying sheep, and sometimes surprising cattle, biting off their tails; it is considered untamable. The painted hyæna (*L. pictus*, Temm.) is by many thought to be a mere variety of the last; it is about 3 feet long, the tail 1 foot more, and 1½ feet high at the shoulders; the colors are much the same as in the preceding animal; it hunts also in packs, surprising antelopes, and attacking when hard pressed for food cattle and even man; Rüppel says it looks much less like a hyæna and more like a dog than the *L. venaticus*.—In anterior geological epochs the hyænas were not confined to tropical Africa and Asia, nor to the old world. They appeared in Europe toward the end of the tertiary age, but were most numerous during the diluvial period, and were found in England, Belgium, and Germany; there were about half a dozen species, numerous in individuals, and of a size sometimes superior to the living animal. In the Kirkdale and other caverns of Europe 3 species are found, of which the best known is the *H. spelæa* (Goldf.). In Asia they were numerous in the Himalaya region, of which the most remarkable is the *H. Sivalensis* (Cautl. and Falc.). In the caverns of Brazil M. Lund has found abundant remains of a hyæna which he calls *H. neogæa*, mixed with the bones of rodents, peccaries, megalonyx, and other American types, seeming to show that the geographical distribution of animals in the modern faunæ is in no way connected with their ancient distribution. The bones of the caverns bear unmistakable marks of the teeth of hyænas, even if the remains of the latter did not prove their existence; and this animal seems to have been the principal consumer of the great proboscideans and ruminants of the diluvial age.

HYBLA, the name of several cities of ancient Sicily, the most considerable of which were the following: 1. HYBLA MAJOR, situated on the southern declivity of Mt. Etna, near the river Simæthus. It was founded by the Siculi, and was one of those which Ducetius, a chief of that people, sought to unite into a confederacy against the Greeks and Carthaginians. In the time of Cicero, Hybla Major was an opulent *municipium*, but in that of Pausanias it was a poor decayed place. Its site was probably at

Paterno, where an altar has been discovered dedicated to *Venus Victrix Hyblensis*. II. HYBLA MINOR, which stood so near Megara that the two cities were often confounded, was likewise of Sicilian origin. It was chiefly celebrated for the honey produced in its vicinity.

HYBRID, the offspring produced by the union of two distinct species of animals or plants. It was taught by Buffon, Hunter, and other naturalists of the last century, and is still maintained by many, that such offspring are incapable of producing their kind, and therefore it is concluded that hybridity is a test of specific character. This supposed connection of hybridity with specific character has led those who adopt it to the firm belief in the reality and distinctness of species, while others think that the facts show that the present varieties of vegetable and animal life were derived from comparatively few original types. In birds hybrids are very numerous, especially in the gallinaceous tribes. In plants they are said to be so common, that some botanists maintain that botanical species are only a higher and more permanent type of varieties, and retain only the genera to designate the characters which have usually been attributed to species. Notwithstanding the occurrence of prolific hybrids, occasionally even in a state of nature for a generation or two, it must be admitted that hybridity is by far the most common among domesticated animals and in those unnaturally brought together by human art, and that the capacity for fertile hybridity is in proportion to the aptitude of animals for domestication. The great source of confusion in estimating the value of arguments drawn from these phenomena is the habit of regarding hybridity as a unit, whereas there are degrees in the series. Dr. Morton makes 4 such degrees: 1, that in which the hybrids never reproduce, the mixed offspring ceasing with the first cross, as in most domesticated birds; 2, that in which the hybrids, incapable of reproduction *inter se*, multiply by union with the parent stocks, as in the ox family; 3, that in which animals of distinct species produce a progeny prolific *inter se*, as the wolf and dog, and other canines; 4, that which occurs between closely allied species, as among mankind and the common domestic animals. After all, there is no such thing as perfect hybridity, as this seems contrary to the general law of nature; the comparatively few exceptions to this law are generally produced by human intervention both in animals and in plants, and are mostly confined to external modifications, the reproductive system not being so impressed as to perpetuate the mongrel breed for an indefinite period; were it otherwise, there would be no such thing as order and distinct specific forms either in the vegetable or animal world. Even in the most favorable cases among domestic animals, constant attention and frequent crossing with the original species are necessary to perpetuate the hybrids, and to keep them from lapsing into one or the other of the primitive stocks. Too much importance has

been attached to these phenomena both as regards man and the lower mammalia, and the extent of the argument that can be drawn from them is, "that the occurrence of prolific offspring between the different races shows that there is a near affinity between the species." The mania for unnatural crosses in mammals and birds at present prevailing ought to be turned to the profit of science, in elucidating the origin of our domestic animals. There are probably few naturalists now who would maintain that the varieties of cattle, sheep, goats, dogs, fowls, &c., are derived from a single wild original modified by man's care or abuse into the present numerous breeds. As there is no necessity for such a single derivation, since we find several wild species equally entitled to be considered the original, the general belief seems to be that our domesticated animals have been produced by the crossing, natural or forced, of several more or less nearly allied species; in other words, that they are complicated hybrid races, crossed and recrossed with each other, with the wild originals, and with allied species, through the care of man, until the primitive stocks can be no longer ascertained with certainty. These phenomena of partial hybridity, therefore, afford no proof that any one species of animals is the parent of the domesticated races. One of the most interesting questions which has been made to turn upon the phenomena of hybridity is that of the unity of the human race, the varieties of which, more or less prolific *inter se*, are therefore asserted to belong to one and the same species. Those who would study this subject intimately are referred to the writings of Dr. S. G. Morton of Philadelphia, especially to his paper in the "American Journal of Science and Arts" for 1847, and to his letters to the Rev. Dr. Bachman in the Charleston "Medical Journal and Review" for 1850-51, in which reference is made to the principal authorities on both sides of the question. See also Prichard's "Natural History of Man" (4th ed. 2 vols., London, 1855), and the work of C. Darwin on the "Origin of Species" (London, 1859).

HYDATIDS. See ENTOMOZOA, vol. vii. p. 225.

HYDE, an E. co. of N. C., bordering on Pamlico sound, and drained by Pango river; area, 830 sq. m.; pop. in 1850, 7,636, of whom 2,627 were slaves. It has a level surface, a large part of which is occupied by pine, cypress, and cedar swamps. The products of the pine are the staples of export. The agricultural productions in 1850 were 14,876 bushels of wheat, 332,525 of Indian corn, and 12,879 of oats. There were 10 churches. Capital, Swan Quarter.

HYDE, EDWARD. See CLARENDON.

HYDE, THOMAS, an English divine and orientalist, born in Billingsley, Shropshire, June 29, 1636, died in Oxford, Jan. 18, 1703. He studied at Cambridge and Oxford, and became head librarian of the Bodleian library. He succeeded Pococke in 1691 as Laudian professor of Arabic,

and soon after was appointed regius professor of Hebrew. He was interpreter of oriental languages to the court during the reigns of Charles II., James II., and William III. He understood Hebrew, Syriac, Persian, Arabic, Malay, Armenian, and Chinese. The most important of his works is *Veterum Persarum et Medorum Religionis Historia* (Oxford, 1700; best ed. 1760). A complete edition of his other writings appeared at Oxford in 1767.

HYDE DE NEUVILLE, JEAN GUILLAUME, baron, a French politician of English descent, born at La Charité-sur-Loire, Jan. 24, 1776, died in Paris, May 28, 1857. He was one of the most active and daring agents of the Bourbons after the death of Louis XVI., and mingled in nearly all the intrigues for the subversion of the revolutionary governments. After the 18th Brumaire, in an interview with Bonaparte, he tried to persuade him to restore the Bourbons. He was charged by Fouché with being an accomplice in the infernal machine plot, but indignantly and successfully cleared himself from the accusation. He subsequently removed to the United States, settled in the vicinity of New York, became acquainted there with Gen. Moreau, then an exile, and is said to have been instrumental in persuading him to return to Europe. Early in 1814 he himself returned to France, and was welcomed by the Bourbons, who had just been reinstated on the throne. He was engaged in all the negotiations and transactions which took place during 1814 and 1815, and on the second restoration was elected by his native department a deputy to the *chambre introuvable*, where he was an uncompromising advocate of the most reactionary measures. In 1816 he was appointed minister plenipotentiary to the United States, and held that office until 1821, when, after being created a baron, he was recalled to France. Being ambassador at Lisbon in 1824, he rescued and restored to power the old king John VI., whom his son Don Miguel had imprisoned. Thenceforth he gradually estranged himself from the ultra-royalist party. In 1828 he entered the semi-liberal Martignac cabinet as minister of the navy, made several improvements in the colonial system, enforced measures against the African slave trade, and favored the independence of Greece. On the breaking out of the revolution of 1830, he asserted the claims of the duke of Bordeaux to the throne in the chamber of deputies, and resigned his seat on Louis Philippe being selected. From that period he devoted himself mainly to agriculture.

HYDER ALI KHAN, sultan of Mysore, an Indian prince and general, born in Dinavelli, Mysore, in 1718, died Dec. 7, 1782. He was of Arabian descent, and son of a petty chief. Entering the service of the rajah of Mysore in 1749, he rose in the course of 10 years to be commander of the forces, and, having thus the power in his own hands, set aside the rajah with a pension of 3 lacs of rupees, and took possession of the sovereignty. The East India company,

becoming jealous of his abilities, formed an alliance with the Mahrattas and the nizam of the Deccan against him; but Hyder not only gained over the nizam to his side, but for two years waged vehement war on the British. By a series of skilful manœuvres he managed to draw their force to a distance from Madras, and then at the head of 6,000 horsemen rode 120 m. in 3 days and appeared before the city. The outlying country being at his mercy, the government of the presidency was disposed to come to terms, and Hyder agreed to a treaty of which the principal feature was that the British should form an offensive alliance with him in his defensive wars. In 1770, the Mahrattas having invaded his dominions, he applied to the British for their promised aid, but could obtain from them nothing more than neutrality. By the year 1778 he had recovered from the disadvantages their defection had caused him. Being once more threatened by the same warlike people, he again invited British assistance, but with a like result. Incensed by this conduct, he formed an alliance with the Mahrattas and the nizam, and in 1780 invaded the British territory of the Carnatic, which he ravaged with fire and sword, capturing many of the strong places, but avoiding battle in the open field. The desolation he brought on the country during the two years' war was such that the British force, and even the city of Madras, were in danger from famine. This war elicited a remarkable display of military talent by the British general Sir Eyre Coote on the one side, and by Hyder and the French officers, of whom he had many in his service, on the other. The Mysore leader had already rejected terms of adjustment offered by Lord Macartney, the governor of Madras, when he died, and was succeeded by his son Tippoo Sultan.

HYDERABAD, or the **NIZAM'S TERRITORY**, a country of the Deccan, in Hindostan, bounded N. E. by Nagpoor, S. E. by the Madras presidency, W. and N. W. by the Bombay presidency, and N. W. by Gwalior and the British districts of Saugor and Nerbudda; area, 95,337 sq. m.; pop. estimated at 10,000,000. The surface consists chiefly of a high table-land watered by the Godavery, Wurdá, Kistnah, and several other rivers, fertile but not well cultivated. Wheat and cotton are the principal productions. The climate, owing to the elevated position of the country, is colder than is usual in this latitude. The territory is crossed by several good military roads. The government is Mohammedan, but the majority of the people are Hindoos. Hyderabad was anciently subject to the rajahs of Telingana and Bijanagur. It was erected into a separate kingdom in 1512 by a Turkish adventurer, and in 1687 became a province of the Mogul empire. Azof Jah, an officer of the court of Delhi, who in 1719 governed this and the 5 other provinces of the Deccan with the title of Nizam-ul-mulk ("regulator of the state"), made himself independent. On his death in 1748 the succession was disputed by his

son Nazir Jung, whose cause was espoused by the English, and his grandson Mirzapha Jung, who was favored by the French. The latter finally triumphed, and governed under the direction of the French commander Dupleix until he was put to death by some Patan chiefs. During a period of anarchy which followed, the French and English supported rival claimants for the sovereignty. Nizam Ali, who came to the throne in 1761, ravaged the Carnatic, but was overpowered by a British force, and induced to sign a treaty in 1766 which gave to the East India company the Northern Circars. The English bound themselves to maintain a military force for the nizam's protection. In the war between the British and Hyder Ali, however, the nizam sided with the sultan of Mysore, but in that with Tippoo Sultan he formed an alliance with the company and the peishwa, and received a share of the spoils of victory. The accession of territory which he then obtained he subsequently ceded to the British in lieu of payment for the support of the British contingent. On the conclusion of the first Mahratta war in 1804 his dominions were again enlarged. The misgovernment of the country under the successors of Nizam Ali plunged Hyderabad deeply in debt. The East India company was at one time creditor to the amount of £500,000 or £600,000, and in liquidation they accepted a cession of territory, part of the revenues of which were to be devoted to the support of the subsidiary native force known as the nizam's contingent. The nizam remained true to the British during the mutiny of 1857-'8, and his dominions were little disturbed except by marauders. The present nizam, Afzul-ud-Dowlah, succeeded to the throne on the death of his father, May 19, 1857.—**HYDERABAD**, the capital of the above territory, is situated on the river Miessi, 389 m. N. W. from Madras, 314 S. from Nagpoor, and 962 S. W. from Calcutta; pop. about 200,000, a large majority of whom are Mohammedans. It is a weakly fortified town, crowded with buildings, some of which are large and imposing, having numerous mosques, and surrounded by gardens of remarkable beauty. The British residency is a magnificent edifice on the opposite side of the river, connected with the town by a stone bridge. In the neighborhood there are large water tanks, one of which is 20 m. in circuit. There is a large British military cantonment at Secunderabad, a few miles N. from the town.

HYDRA. See **HERCULES**.

HYDRA, an island in the Grecian archipelago, off the E. coast of the Morea; greatest length N. E. to S. W. about 12 m., greatest breadth 3 m.; pop. about 20,000. Its surface is rocky, sterile, and mountainous. The inhabitants are esteemed the best sailors of Greece, and rendered important services during the war of independence.—**HYDRA**, the capital of the island, is situated on a barren rugged height on the N. W. shore; pop. about 12,000. The streets are steep and uneven, and the houses

substantially built. The manufactures are silk and cotton stuffs, soap and leather. The harbor is formed by a deep bay, but is neither spacious nor well sheltered. While the war of the revolution raged Hydra was a place of general refuge for people from all parts of Greece.

HYDRABAD, a town of British India, in the province of Sinde, situated on an eminence belonging to the Gunjah hills, 4 m. E. from the E. bank of the Indus; pop. about 24,000. Part of it is built on an island 15 m. long, which is formed by the Indus and an offset of that stream called the Fulailee. It is defended by a fortress of imposing appearance but no great strength, and has manufactures of matchlocks, swords, spears, and shields, and of ornamental silks and cottons. The town is to be connected with Kurrachee on the Arabian sea by a railway 120 m. long, which was begun in April, 1858. Hydrabad was formerly the residence of the chief amcers of Sinde, who governed the S. and principal part of the country. A victory was gained over a Sindian force near here by Sir C. Napier, Feb. 24, 1843.

HYDRANGEA (Gr. *ὕδωρ*, water, and *αἴγος*, a vase), a genus of shrubby plants, so called from their predilection for water, and from the calyx of some species resembling a cup, belonging to the natural order *saxifragaceæ*, and natives of Asia and of North America. The species best known by this name (*H. Hortensis*) received the generic name of *Hortensia* from Commerson, and this name it still bears in France. The common hydrangea was brought to England from China in the year 1790. Cuttings of the wood or of the growing stems will root without difficulty; those of the latter make roots soonest, and if they are then potted in rich soil, they will grow rapidly. The hydrangea delights in an unlimited supply of water, fading at once on its being withheld. There has lately been introduced into cultivation a variety with variegated foliage, nearly all silvery white. In some parts of England the common hydrangea stands the winter, very severe weather only killing the stems to the roots. Specimens there are mentioned of 30 feet circumference, and producing on a single plant more than 1,000 heads or corymbs of flowers. In the United States, even so far north as Boston, it will survive the winter, if slightly protected by the stems being covered. The Japan hydrangea (*H. Japonica*, Siebold), introduced into this country about 15 years ago, and into England a short time previous, is considered inferior in both leaf and blossom. The wild hydrangea (*H. arborescens*, Linn.) is a shrub having a stem 4 to 6 feet high with opposite branches, leaves 3 to 6 inches long, ovate, pointed, serrate, and green on both sides; its flowers, which are borne on flat cymes, are white or yellowish, and usually all fertile. The species ranges from Pennsylvania and Ohio southward to the mountains of Carolina. The oak-leaved hydrangea (*H. quercifolia*) was first discovered by Bartram in his travels through the southern states,

and is attributed by Elliott to Georgia. It was carried to England in 1803, and is considered the finest of the North American species. It has deeply lobed, sinuate leaves, and fine large corymbs of nearly white flowers, which change afterward to purple. In the gardens at the north is often seen the snowy-leaved hydrangea (*H. nivea*, Mx.), a shrub from 6 to 8 feet high, with large leaves of a silvery whiteness beneath, and flowers in terminal cymes, having a few showy, white sterile florets enclosing many small green fertile ones. It grows naturally in the upper part of Georgia and the Carolinas.

HYDRATES (Gr. *ὕδωρ*, water), compounds in which water is an ingredient in definite proportion. Thus lime (oxide of calcium) slaked with water forms a chemical combination with a portion of this, and falls to a white powder, which is a hydrate of lime (CaO, H₂O). Hydrate of potassa is a combination of one equivalent of potassa and one of water, and is permanent even when exposed to high temperature. Common oil of vitriol is also a chemical combination of one equivalent of water and one of pure concentrated sulphuric acid.

HYDRAULIC RAM, or WATER RAM, a machine first erected by John Whitehurst in Cheshire in 1772, and improved by Montgolfier, the object of which is to raise a small stream of water to a considerable height by the power afforded by a larger stream with little fall. The main current is made to flow through a pipe from the reservoir which feeds it, and which by its elevation above the lower end of the pipe furnishes the required power. An opening on the upper side of the pipe at the lower end allows the water to escape; but this opening is supplied with a valve, in the form of a hollow metallic ball, held within the pipe in a sort of claw directly under the opening. As the current acquires velocity this ball, twice as heavy as the water it displaces, is lifted up and shuts the orifice of escape. Another similar but smaller valve is placed on a short upright length of pipe a little above the lower valve, and works in the opposite direction, closing the orifice by its descent, and opening it as it is lifted up. This short pipe opens above into a strong metallic chamber, which serves as a reservoir of water in its lower part, and of air above. A tube, called the ascension tube, leads from the water through the wall of the chamber to any place required. The recoil of the water throws up the valve and opens the passage into the chamber, the action being facilitated by the spring produced by the pressure upon a body of air contained in an annular space surrounding the valve box, which is let a little way down into the short upright pipe to give room for this annular chamber. As the impulse fails which opens the upper valve, the lower one is relieved of the pressure which lifted it and falls down, opening the outlet, and the other also falls, closing the orifice into the chamber, when the force again accumulates, repeating the operation. With each stroke a quantity of water is inject-

ed into the large chamber. The air in the upper part of this is each time compressed, and by its elasticity drives the water up the ascension tube, equalizing the effect of the strokes. Montgolfier was thus able with a head of $7\frac{1}{2}$ feet to raise to the height of 50 feet a quantity of water compared with the whole that flowed as 2 to 21, making the useful effect as 64 to 100 of that expended; but it is more commonly about $\frac{1}{2}$ of that expended. A uniform flow may be obtained without the air chamber by using two or more rams, and connecting their ascension tubes into one. Water has thus been raised at Marly in France to the height of 187 feet. The younger Montgolfier improved the ram so as to obtain for it a useful effect of 60 per cent. The changes introduced were in the form of the valves, the lower one, of dish shape, being attached to a guide stem, which kept it in place as it worked up and down, and was so contrived as to give longer or shorter play to the valve as circumstances required. For the annular air space was substituted an air chamber of similar form to the large one, within which it was contained, and into which it opened by two valves. Under it a capillary open tube connected with the air without, and with each stroke a jet of water was forced out and air returned, the latter serving to keep up the supply required by the air chambers. Its entrance was caused by the reduced pressure within the smaller air chamber immediately after the elastic force had expended itself, this pressure for an instant becoming less than that of the air without. When the water is propelled by the ram to considerable height, its workings are so violent that the ground is shaken, and the tremor is felt through the whole length of the pipe. This destructive action is partially corrected by the improvements introduced in the rams constructed by Mr. Birkinbine of Philadelphia. In these the force of the blow of the larger valve as it rises is received by a portion of water caught between the valve and its seat, which serves as a water cushion. Some of the larger rams are worked by driving pipes of 6 inches diameter, and one of these with a fall of 6 feet is capable of raising 20,000 gallons per day 60 feet high.

HYDRAULICS. See HYDROMECHANICS.

HYDROCEPHALUS (Gr. *ὕδωρ*, water, and *κεφαλή*, the head), dropsy of the brain. Chronic hydrocephalus is commonly the result of either a malformation of the brain, or a chronic inflammation of the lining membrane of the ventricles. It is for the most part congenital, or shows itself within a few weeks after birth, though it sometimes seems to have been caused by injuries received on the head in early childhood. Congenital hydrocephalus is occasionally an obstacle to childbirth, the head requiring to be lessened before it can be delivered with safety to the mother. When it occurs after birth, the head gradually enlarges, assuming a globular form, the sutures and fontanelle becoming more and more open. As the nutrition of the remainder of the body is imperfect and its growth

dwarfed, the contrast between the immense head, the weight of which the child is unable to sustain, and the small and infantile face, gives the patient a strange and characteristic aspect. More or less squinting or a constant rolling motion of the eyes is an attendant upon the disease. The intellect is weak, and the child is subject to spasmodic attacks and convulsions; exhaustion, diarrhoea, or convulsions generally terminate the patient's existence at an early age; in one instance, however, an extreme case, the patient reached the age of 29 years. A variety of remedial means have been recommended, but their effects are very uncertain, and the complaint when once fairly established may be looked upon as hopeless.—*Acute Hydrocephalus*. Dr. Whytt in 1768 was the first to call the attention of the medical profession to the fact that in a large class of cases in young children, evidently involving the brain and rapidly terminating in death, the ventricles of the brain were apt to be more or less distended by a serous effusion; to this effusion the symptoms during life were attributed, and the disease was classed as a dropsy. Toward the commencement of the present century the inflammatory origin of the disease began to be recognized, and about the year 1830 the observations of MM. Ruzé and Gherard, at the *hôpital des enfants*, proved the tubercular nature of by far the greater number of cases. In consonance with more correct views of its pathology, the disease has accordingly been termed tubercular meningitis. As would be anticipated, it is most apt to attack feeble and delicate children, especially those who have inherited a tendency to tubercular complaints; yet it often occurs in those who until its invasion have appeared to be in good health. In the beginning the child is fretful and irritable, it loses its appetite, and its movements are sluggish; the bowels are apt to be constipated, the evacuations scanty and offensive, the skin dry, and the pulse accelerated. If old enough, the child complains of headache, or it carries its hands to its head; it is unusually sensitive to light and noise; it seems drowsy, but sleeps badly, starting and grinding its teeth. Occasionally it appears for a few moments to lose its consciousness, gazing fixedly with its eyes wide open, and then suddenly resuming its former manner. It is often attacked with vomiting, which continues, without apparent cause. After more or fewer of these symptoms of nervous disturbance have continued for a variable number of days, the complaint becomes fully formed. The child remains in a drowsy condition, the eyes closed, the brow contracted, and the countenance expressive of suffering. It is averse to being disturbed, answers shortly and quickly, and if old enough complains only of its head and of weariness. The skin remains hot and dry; the pulse, at first more frequent, often suddenly becomes comparatively slow. At night there is an exacerbation of fever attended with restlessness, and often with delirium. Sometimes

the child continues to utter at intervals a short piercing cry characteristic of the disease. The bowels remain confined, and the evacuations are scanty and unnatural, though the abdomen is neither hard nor full; on the contrary, it is commonly retracted. The pupils are sometimes natural, and sometimes one is dilated while the other is contracted; they are apt to be sluggish to the influence of light, and squinting often occurs. Toward the close of the disease, the child sometimes falls into a state of stupor, from which it cannot be roused; frequently convulsions ensue, followed by paralysis of one side, with automatic movements of the other. The child often picks at its nose, lips, or head, drawing blood and leaving frightful-looking ulcerations. The eyes remain constantly half open, filmy, insensible to light, and commonly squinting; the cheeks are now flushed, now pale; the head is often retracted; the pulse becomes feeble and exceedingly frequent, and the child is more and more emaciated, until finally death after a variable interval closes the scene. The appearance after death to which for a long time the attention of observers was confined is the increased quantity of fluid in the ventricles; this varies greatly in different cases, and is in general perfectly transparent. The pia mater, and more especially the arachnoid membrane, particularly at the base of the brain, present a milky or opaline appearance; often more or less yellow lymph is found underneath the latter membrane. Beside these appearances, a number of minute granular bodies are found scattered within the membranes, the largest of them being of the size of a small pin's head; some of these bodies are yellowish and friable, others grayish, semi-transparent, and resistant. These bodies are always associated with the presence of tubercles in other organs of the body, and the general opinion of pathologists is that they are tubercular.—When the disease is recognized as tubercular meningitis, the prognosis is exceedingly unfavorable, the cases of cure on record being few and doubtful. More can be done to ward off the attack of the disease than to cure it after its development. To this end, all efforts must be directed toward strengthening the system of the child, and repressing undue activity of the brain or nervous system. In the commencement, and when the diagnosis is still uncertain, the employment of mild but efficient purgatives seems to be indicated; calomel with rhubarb and soda are among the most useful. Occasionally the application of a few leeches to the head may be advisable, but the disease occurs mostly in children who bear depletion badly. When the complaint is thoroughly established, all measures seem to be of no avail; still a few cures are reported which appear to have been obtained by the employment of large doses of iodide of potassium.—In rare instances meningitis appears independently of a tubercular origin. Here the disease occurs in children who have been previously healthy. It is more violent in its invasions, being commonly ushered in by

convulsions, which often recur until the death of the patient; and its course is shorter, rarely lasting beyond a week. After death none of the granulations characteristic of tubercular meningitis are found, but the serum effused in the ventricles is apt to be turbid, and pus is sometimes found on the surface of the brain. The treatment must be prompt; leeches and cold to the head, active purgatives, and stimulating foot baths are recommended.

HYDROCHLORIC ACID, or **CHLOROHYDRIIC ACID**, a gaseous compound of one equivalent of chlorine and one of hydrogen (HCl), of combining proportion 36.5, long known in its aqueous solution by the names of muriatic acid, marine salt, and spirit of salt, in reference to its being prepared from sea salt (*murias*). Priestley first obtained it as a gas in 1772, and Gay-Lussac, Thénard, and Davy long afterward showed that it consists of equal volumes of chlorine and hydrogen, and occupies the same space as the gases which produce it. Its elements mixed together slowly combine by the action of the light, but instantly with explosion if exposed to the direct rays of the sun, or if an electric spark is passed through the mixture, or a lighted taper is brought in contact with it. The gas is obtained by adding concentrated sulphuric acid to common salt placed in a retort, and collecting over mercury. The chlorine of the salt (chloride of sodium) unites with the hydrogen of the water of the sulphuric acid, and the sodium, taking the oxygen of the water, forms with the sulphuric acid sulphate of soda; or, by symbols, $\text{NaCl} + \text{SO}_3, \text{H}_2\text{O}$ yields $\text{NaO}, \text{SO}_3 + \text{HCl}$. The gas is colorless, but escaping in the air it instantly unites with moisture present, and forms a white cloud. It has a strongly acid taste and a pungent odor. Taken into the lungs it is irrespirable, but when diluted with air is not so irritating as chlorine. It neither supports combustion nor is itself inflammable. Under a pressure of 40 atmospheres, at 50°F ., it is condensed into a liquid of specific gravity 1.27. The density of the gas is 1269.5, air being 1000. Its affinity for water is such that it can be kept only in jars over mercury. If a piece of ice be introduced into a jar containing the gas, the ice is instantly liquefied, and the gas disappears. If the jar be opened under water, the water rushes up as into a vacuum. A cubic inch of water absorbs 418 cubic inches of gas at 69° , and becomes 1.34 cubic inches. The aqueous solution is the form in which the acid is commonly known. It is of various degrees of strength, the strongest readily obtained having 6 equivalents of water to one of acid, 40.66 per cent. of real acid, and being of specific gravity 1.203. This loses acid by evaporation, coming, according to Prof. Graham, to 12 equivalents of water to one of acid, this containing 25.52 of real acid, and being of specific gravity 1.1197. When reduced by distillation till it changes no more, it contains 16.4 equivalents of water and 20 per cent. of real acid, and is of specific gravity 1.0947. The following table by Mr. Ed. Davy gives its strength at different densities:

Sp. gr.	Quantity of acid per cent.	Sp. gr.	Quantity of acid per cent.
1.21.....	42.43	1.10.....	20.20
1.20.....	40.80	1.09.....	18.18
1.19.....	38.38	1.08.....	16.16
1.18.....	36.36	1.07.....	14.14
1.17.....	34.34	1.06.....	12.12
1.16.....	32.32	1.05.....	10.10
1.15.....	30.30	1.04.....	8.03
1.14.....	28.28	1.03.....	6.00
1.13.....	26.26	1.02.....	4.04
1.12.....	24.24	1.01.....	2.02
1.11.....	22.22		

An approximate result is obtained by multiplying the decimal of the specific gravity by 200.—The pure concentrated acid is colorless, and fuming when exposed to the air. It is conveniently used for most purposes diluted to a specific gravity of about 1.1, at which it does not fume. Though powerfully acid, it is not so corrosive as sulphuric acid. It is decomposed by substances which yield oxygen freely, as the peroxide of manganese, and is thus made to furnish chlorine gas, its hydrogen combining with the oxygen of the metallic oxide. Nitrate of silver detects its presence by a white curdy precipitate (chloride of silver), soluble in ammonia, but not in nitric acid, which forms on the addition of a drop or two of its solution.—The ingredients used for preparing hydrochloric acid, either upon a large or small scale, are common salt, sulphuric acid, and water. Different proportions are adopted, the most usual being equal weights of concentrated acid and of salt, or in the large way 6 parts of salt to 5 of acid, being an equivalent of each. In the small way, by distilling in a glass retort, may be used 3 parts or 1 equivalent of chloride of sodium, 5 parts or 2 equivalents of oil of vitriol, and 5 parts of water. The acid mixed with 2 of water is poured when cool upon the salt contained in a large retort, and the remaining 3 parts of water are placed in the vessel serving as a condenser to receive the gas. Heat is applied to the retort, and the acid gas distils over; the water in the condenser allows none of it to escape, so long as it is kept cool and is not saturated. The aqueous solution obtained is of specific gravity about 1.17, and contains 34 per cent. of dry acid. The residuum is bisulphate of soda. The acid is so cheaply prepared in large chemical works, that it is seldom made in the laboratory. It is an incidental product in the manufacture of carbonate of soda, and was formerly allowed to go to waste. The commercial article is often contaminated with iron, which gives it a yellow color, though this is sometimes owing to organic matter, as cork or wood. Sulphuric acid is almost always present in it, and sometimes free chlorine and nitrous acid. Sulphurous acid has also been found to the amount of 7 to nearly 11 per cent. Sulphuric acid is detected by the white precipitate of sulphate of baryta produced when chloride of barium is added to a diluted portion of acid. Protochloride of tin decomposes sulphurous acid, and causes after a time a brown precipitate to appear. Arsenic and chloride of lead may sometimes be detected by a current

of sulphuretted hydrogen. The common method of purifying is to dilute, add chloride of barium, and distil.—The acid is largely employed in the arts, especially as a solvent for mineral substances. In combination with nitric acid it makes the *aqua regia*, used for dissolving gold and platinum. It is used to furnish chlorine in the preparation of bleaching and disinfectant salts, and in the production of sal ammoniac; and is employed to extract gelatine from bones. When neutralized with basic oxides, it does not combine as an acid with these, but gives its hydrogen to their oxygen, and its chlorine unites with the metallic base of the oxide. In medicine the acid is employed as a tonic, refrigerant, and antiseptic. The latter quality recommends it as an adjunct to gargles in ulcerated sore throat and scarlet fever.

HYDROCYANIC ACID, or **PRUSSIC ACID** (HCy ; chemical equivalent 27), was first obtained in its aqueous solution by Scheele in 1782, who described it correctly as consisting of hydrogen, carbon, and nitrogen; but the true nature of the compound was determined by Gay-Lussac 30 years later, who first obtained the anhydrous acid. This is a colorless, inflammable liquid, possessing a strong odor, which is recognized in peach blossoms; but when exhaled from the pure acid it is so powerful as to cause immediate headache and giddiness, involving the most serious consequences to life itself. The vapor is so remarkably volatile, that a drop of the acid congeals upon a piece of glass by the rapid evaporation of a portion of the liquid. It boils at 80° , and freezes at 5° into a fibrous mass. At 64° its specific gravity is .6969. Its taste (a hazardous test) is acrid and bitter like that of bitter almonds. Its acid properties are feeble; the faint red tinge it imparts to litmus paper soon disappears; and it fails to decompose salts of carbonic acid. It exists in parts of many plants, as the kernels of peaches, almonds, plums, &c., and in the leaves of the peach, laurel, &c. It is also generated in the processes contrived for extracting it from various vegetable matters. The chief source of the acid, however, is the animal kingdom, the blood, hoofs, horns, and tissues of the animal body being made to furnish cyanogen to potassium on being ignited with carbonate of potash, and the cyanide thus obtained and other cyanides of the same derivation are employed to furnish the cyanogen for the acid. Its detection in the cyanide salt, Prussian blue, gave it the name of Prussic acid. Many methods have been devised for preparing the anhydrous acid. The cyanide of mercury has been decomposed together with hydrochloric acid, thus producing chloride of mercury and hydrocyanic acid; and sulphuretted hydrogen and also diluted sulphuric acid have by suitable processes been substituted for the hydrochloric acid. But the aqueous solution or medicinal acid is commonly prepared direct by some one of the numerous processes of the pharmacopœias. The following, adopted in the United

States, is recommended for its simplicity and convenience. Of cyanide of silver 50½ grains are dissolved in 41 grains of hydrochloric acid diluted with a fluid ounce of distilled water; the mixture is shaken in a well stopped vial, and the clear liquor, poured off from the insoluble matter which subsides, is kept in tight bottles excluded from the light. Single equivalents of the acid and cyanide salt are employed; and by their mutual decomposition hydrocyanic acid is obtained in solution, and chloride of silver falls as a precipitate. By this method the acid may always be prepared as wanted—a matter of no little importance in its medicinal applications, in consideration of its liability to spontaneously decompose, and its consequent uncertain composition and strength. The aqueous solutions prepared by the different processes adopted are not uniform in their proportions of anhydrous acid; but their strength ought not to exceed 3 per cent. of pure acid. Various methods are given in the chemical books of ascertaining this strength and the degree of purity. Sulphuric and hydrochloric acids are the most common foreign bodies present. The quantity of real acid is usually determined by the weight of cyanide of silver precipitated on adding nitrate of silver. By the U. S. formula 100 grains of pure acid must accurately saturate 12.7 grains of nitrate of silver dissolved in distilled water, and produce a precipitate of cyanide of silver, which, washed and dried at a temperature not exceeding 212°, shall weigh 10 grains and be wholly soluble in boiling nitric acid. If a residue remain, it is chloride of silver, indicating the presence of hydrochloric acid in the original. Sulphuric acid would be indicated by a precipitate formed on adding chloride of barium to a portion of the acid.—Hydrocyanic acid is well known as one of the most powerful of poisons, destructive to vegetable as well as animal life. Seeds immersed in it lose their germinating power, and the stems of sensitive plants lose their peculiar property by its application. A drop of the anhydrous acid placed on the eye or throat of a dog will cause violent convulsions, soon terminating in death. Its vapor produces similar effects. Its action appears to be upon the heart, to which it is conveyed by the blood. Its medicinal properties were experimented upon by Italian practitioners in 1806. Magendie recommended its employment in diseases of the chest in 1817; and Drs. A. F. Thomson and Elliotson, by their investigations in 1820 and 1821, caused its use to be much extended in England. Dr. Pereira notices the following symptoms attending its use in gradually increased quantities: a peculiar bitter taste, increased secretion of saliva, irritation in the throat, nausea, disordered respiration, pain in the head, giddiness, sometimes faintness, obscurity of vision, and sleepiness. It has been used in pulmonary complaints, asthma, whooping cough, &c., and in violent and painful affections of the stomach unattended with inflammation; also as an anodyne in cancer, tic

douloureux, &c., and externally as a wash in some cutaneous diseases. It should from its uncertain strength be always administered in its minimum dose, and this gradually increased. In case of poisoning by an overdose, the antidote most to be depended upon is either ammonia or chlorine, administered internally in weak aqueous solution, and the vapor inhaled. Chloride of lime may offer itself as a ready means of affording the chlorine solution; and carbonate of ammonia, if at hand, or else the smelling salts, may be used to furnish the ammonia. Affusions of very cold water upon the head and spine have resuscitated animals apparently dead from the effects of hydrocyanic acid. Respiration by artificial means is also recommended. After death and before decomposition has taken place, the presence of hydrocyanic acid is rendered apparent in the blood vessels and also in the brain by its peculiar odor. To obtain the acid, the contents of the stomach should be washed with distilled water and filtered, and the filtrate distilled in a water bath. The product may then be subjected to the various tests given in the chemical works. One lately suggested by Liebig is recommended as also applicable for the estimation of the acid in cherry laurel water and other fluids in which it is present in very small quantity. To the hydrocyanic acid solution, after it is supersaturated with potassa, are added a few drops of chloride of sodium; nitrate of silver is now gradually added, and cyanide of silver is produced and dissolved by the cyanide of potassium, the two forming a double cyanide consisting of an equivalent of each. When a precipitate begins to appear, the amount of hydrocyanic acid that was present is known from the amount of nitrate of silver employed, being in the proportion of 2 equivalents to one of silver. If 85 grains of nitrate were used, this would give 54 of silver, and ¼ this or 27 grains would be the quantity of hydrocyanic acid present.

HYDRODYNAMICS. See HYDROMECHANICS.

HYDROGEN (Gr. *ἵδωρ*, water, and *γενναω*, to produce), an elementary gaseous body, named from its property of forming water by combining with oxygen. Its symbol is H; chemical equivalent 1; weight compared with air .06926; 100 cubic inches weigh under ordinary pressure and temperature 2.14 grains, being 16 times less than an equal volume of oxygen, and 14.4 times less than air. It was known near the close of the 17th century, and was termed inflammable air from its burning with a flame; it was also called phlogiston, from the supposition of its being the matter of heat. Its real nature was first described by Cavendish in 1766 ("Philosophical Transactions," vol. lvi. p. 144). The gas is not found uncombined, but is readily obtained by decomposing water, of which it constitutes about ¼ by weight, the remainder being oxygen. This process is effected very much as metallic oxides are decomposed, some substance being presented to the compound which has a strong affinity for the

oxygen, and combining with it liberates the hydrogen or other element. The vapor of water passed through an iron tube filled with iron shavings and kept at a red heat is thus decomposed, the oxygen uniting with the iron, and the hydrogen escaping. The common method of preparing the gas is to place some bits of zinc in oil of vitriol or sulphuric acid diluted with 5 or 6 times its bulk of water. Chemical action immediately takes place, and the zinc is dissolved with effervescence, owing to the bubbles of hydrogen separating from the liquid; an atom of zinc unites with one of sulphuric acid and one of oxygen, forming a sulphate of oxide of zinc, and an atom of hydrogen is set free, as represented by the formula $\text{HO} + \text{SO}_4 + \text{Zn} = \text{ZnO} + \text{SO}_4 + \text{H}$. With an ounce of zinc there may be obtained 615 cubic inches of hydrogen. A common flask answers very well for the apparatus, by inserting a bent tube through the cork for the exit of the gas, and a straight tube, terminating above in a small funnel, and reaching below the cork nearly to the bottom of the flask, at least so as to be covered by the liquid. Through this tube the acid is poured in as required, the zinc and water being first introduced. The sulphur and carbon present in almost all zinc appear in the hydrogen as traces of sulphuretted hydrogen and carbonic acid. They may be separated by agitating the gas with lime water. When pure, hydrogen has neither taste, smell, nor color. It is destructive to animal life when inhaled for a short time, and extinguishes a burning taper plunged into it. Yet it is itself highly combustible, burning with a faint bluish yellow flame at its contact with atmospheric air or oxygen; and when mixed with proper proportions of either and ignited by flame, an electric spark, or a glass rod heated hardly to redness, its combustion is instantaneous and explosive. A piece of spongy platinum introduced into the mixture also causes combustion to take place. The most violent effects are produced by a mixture of 2 volumes of hydrogen and 1 of oxygen. The only product of the combustion of hydrogen is water. The gas is made to enter into combination with the oxygen of the air, producing heat sufficient to cause its ignition, by directing a jet of it upon a piece of spongy platinum, or even upon a perfectly clean surface of sheet platinum. The metal becomes red hot, the gas ignites, and thus a light may be instantaneously obtained. A little apparatus has been devised for this purpose, and would be an excellent means of obtaining a flame in the absence of the cheap matches in common use. Though the flame of hydrogen is very slightly luminous, a bright light is emitted from the heated platinum; and an apparatus based on this principle has been applied to purposes of illumination in the place of ordinary gas lights. Such lights are said to be in practical use in France and England. The hydrogen is produced by the decomposition of water, effected by passing its vapor over incandescent charcoal contained in

a tube; some carbonic oxide and carburetted hydrogen are generated, which burn with the hydrogen, the jet of mixed gases being directed against a basket constructed of fine gauze of platinum, which becomes intensely hot and highly luminous. Hydrogen produces intense heat by its combustion, taking up more oxygen than is required by the same weight of any other combustible. It is this property that has led to its application in the oxyhydrogen blow-pipe for melting the most refractory substances. (See BLOWPIPE.) The levity of hydrogen early suggested its use for filling balloons. The quantity required to fill one of the capacity of 2,000 cubic feet would weigh only 10.57 lbs., while the same volume of air would weigh 153.26 lbs., giving an ascensional power of 142.69 lbs. Illuminating gas is heavier, but is commonly used instead of hydrogen only on account of its greater cheapness. Hydrogen is so subtle and penetrating a gas that it passes with facility through paper and also through gold and silver leaves. A stream of the gas directed against one side of the leaf may be ignited on the other. Hydrogen combines with one equivalent of oxygen to form the protoxide of hydrogen or water; with two equivalents to form the binoxide, or oxygenated water, a liquid discovered by Thénard in 1818, and now rarely prepared by chemists; also with one equivalent of nitrogen to form ammonia; and with one of chlorine to form hydrochloric acid.

HYDROGRAPHY, the art of surveying and describing the sea, lakes, rivers, and other navigable waters, and the particulars in regard to the tides and currents; also of constructing charts *in plano* showing the coasts, rocks, shoals, depths of water, bearings, &c. The invention of sea charts is commonly ascribed to Henry the Navigator (1394-1463), though earlier ones exist. These charts were rude and imperfect, the size of the earth being then unknown, the log for measuring nautical miles not in use, and the sea astrolabe being the only instrument for determining latitude. He however laid the foundation for the science of hydrography, but until the middle of the 18th century the progress in marine surveys was almost nothing, and the commercial world were indebted to individuals alone for hydrographical information. The expeditions of Capt. James Cook under the auspices of the British government may be considered the commencement of another era. He had received instruction under Des Barres, who was a pupil of John Bernouilli, and was afterward appointed marine surveyor of Newfoundland and Labrador. (See DES BARES.) The success of this accomplished navigator excited the French government to follow the example, and the expedition of La Pérouse, consisting of two frigates and a scientific corps, was fitted out in 1785, to finish what Cook had commenced. The voyage ended disastrously, but fortunately journals and charts of his discoveries prior to his arrival at Botany Bay were sent home. Not being again heard from, an expedition under

D'Entrecasteaux was sent in search of him in 1791, but no information was obtained as to the missing ships. M. Beautemps-Beaupré was principal marine surveyor in this expedition, and published a treatise on nautical surveying, as an appendix to the narrative of the voyage, in 1808. This work, with the exception of a small "Essay on the most Commodious Methods of Marine Surveying," by Alexander Dalrymple (1771), was the first treatise published in a practical shape, and gave an impulse to the cultivation of this branch of their profession by naval men. About this period M. Beautemps-Beaupré took charge of the survey of the French coast, and trained a corps of hydrographical engineers, which enabled him to conduct that extensive work in a manner creditable to the nation, and provide competent surveyors for future expeditions. Spain has done much for hydrography, but in another way. The custom of examining officers as to their competency to navigate a vessel before promotion has given a high reputation to its mercantile marine, and nautical information from this class has been exceedingly valuable. At present, to render hydrographical surveys more perfect, professional hydrographers are employed, and hydrography is dependent on geodesy where any extensive surveys are carried on. Great Britain, France, and other nations have availed themselves of their trigonometrical surveys, and in the U. S. coast survey the trigonometrical and hydrographical labors are carried on together; this last is the greatest hydrographical work ever undertaken, and for accuracy and rapidity of execution has never been equalled. (See COAST SURVEY.) Almost every commercial nation has now its hydrographic office, and appropriations are made for surveys, not only of their own coasts, but those of other countries. The admiralty of Great Britain are, however, the most active in collecting and distributing information.

HYDROMECHANICS, that branch of natural philosophy which treats of the mechanics of liquid bodies, or in other words, of their laws of equilibrium and motion. A great diversity prevails in the naming of this science and its two divisions; but by employing the term above given, with hydrostatics and hydrodynamics as the titles of the divisions, we adopt a nomenclature exactly corresponding with that of general mechanics, as well as true to the nature of each subject, and the previous usage of the terms themselves. Hydromechanics comprises properly those phenomena of liquids by which these bodies differ from solids or from bodies at large; hence, its foundation is laid in the properties that distinguish the liquid from other states of bodies, viz., the presence of cohesion, with great mobility of parts, and perfect elasticity. **I. HYDROSTATICS.** Suppose a hollow cylinder of any depth containing liquid, that this liquid could be destitute of weight, and that a movable piston of 100 square inches area exactly covers its upper surface; there would be no pressure of such a liquid itself

on the bottom of the hollow cylinder; but if a downward load or pressure of just 100 lbs. were applied to the piston, it is plain that this would be a pressure of 1 lb. on every square inch of its area; and the liquid not being compressible in any marked degree, and hence not capable of yielding before the piston, this pressure must be imparted downward from layer to layer, and must amount to a force of 1 lb. on each square inch of the base. A piston of 1 square inch area in the base would therefore receive 1 lb. of the pressure thus applied, and in proportion for any area. Again, if in various parts in the bottom, sides, and top of a vessel containing a confined body of water, pistons of equal size be inserted, and a given force applied upon any one of these, it is found that the same amount of pressure precisely is felt by each of the others, no matter what their number. Thus we arrive at the important and fundamental laws of hydrostatics, viz.: 1, that liquids transmit through their mass any pressure applied to them without diminution, so that the pressure is felt equally upon every equal area of the liquid or its enclosure; 2, weight being disregarded, the pressure is proportional to the area of every surface receiving it; 3, it is transmitted equally in all directions, upward, downward, and laterally. These results are simply due to mobility of parts with incompressibility, in effect, of mass. But as a consequence of this equality of pressure on every equal area within a liquid, the remarkable fact follows that if on a piston of 1 square inch area, touching the surface of a confined body of water, any pressure, say 10 lbs., be exerted, another piston of any larger area, say 40 square inches, in contact with the same body of water, will receive the given pressure on every surface of equal size, and consequently feel, and by proper connections transmit to machinery, the original pressure of 10 lbs. multiplied by the increase of area, in this case 400 lbs. In this way a confined body of liquid serves, first, as a convenient means of transmitting power, and, friction not considered, in any direction or to any distance; and secondly, as a means of multiplying the action of a power; so that water has been properly considered as a 7th element of machinery. The principle now explained includes all that is peculiar in the construction and action of Bramah's hydrostatic press; although in this the power applied can be further increased by the use of the lever, &c., or converted into velocity by trains of wheels. This most powerful of existing machines is used for pressing paper, cloth, gunpowder, &c., raising ships in docks, or any ponderous bodies. That employed in raising the immense tubes of the Britannia bridge had pistons whose respective areas were as 1 to 354, and, with a power on the smaller of 3.8 tons to the square inch, exerted a lifting force of 2,622 tons, and was calculated to be capable of throwing water in a vacuum to a height of 5.4 miles.—But the weight of the upper parts of any liquid mass must be sustained by the lower: and hence, the latter receives

a pressure from this cause that is proportional in every case to the depth or perpendicular distance of the part considered below the surface of the liquid. A horizontal square inch of surface at a depth of 1 foot in a liquid mass is pressed upon with the weight of the liquid column resting upon it, viz., nearly $\frac{1}{2}$ lb.; at the depth of 2 feet, by double this, or nearly $\frac{1}{2}$ lb.; and so on. Every particle of the liquid in such square inch is pressed downward with a force due to the weight of the minute column it sustains. But if a liquid be poured into any vessel or reservoir, and no further agitation imparted to it, it soon comes completely to rest; every part is presently in a state of equilibrium; and hence it follows, again, that whatever pressure a given particle or surface within a liquid may receive and exert, whether by the weight of parts over it, or by force applied from without upon a confined body of it, the contiguous parts of the liquid, by reaction, exert against this an equal pressure and in all other directions, upward and laterally. If this were not so, the particles pressed upon must move; and a liquid mass, instead of coming to rest, would be in a state of continued movement within itself. The upward and lateral pressures against a liquid particle or any surface at 2 feet depth, then, are just twice as great as they are at 1 foot depth; and so for any depth whatever. Consequently, though a vessel with perpendicular sides receives on its bottom the only pressure which a solid filling it, as ice, is capable of exerting, yet if the same ice be changed to water, there will be the same pressure as before on the bottom, and additional pressure arising against the sides of the vessel. With the contained solid, the whole tendency to burst the vessel is only equal to the whole weight of the solid; but with the contained liquid, much greater. Hence, again, if a small and a large column of liquid of equal heights meet in a common surface below, of any shape or size, the downward pressures of the two columns being at the same depth equal on any particle in the common surface of the two, the upward or lateral supporting pressures thence arising on the two sides will also be equal, and the two columns must perfectly balance. Liquids, then, balance each other by their pressures, not by their weights; and their pressures are as their perpendicular heights, not as their quantities. This is still true, though one or both the columns or bodies be oblique or irregular, and though the communication be by any set of tubes, not rising above the common surface, or otherwise. Any quantity of liquid, however small, then, must balance any other, however great, provided the perpendicular heights be the same. Of this principle, commonly termed the "hydrostatic paradox," a familiar illustration is seen in the balancing of the liquid in the body of a coffee pot by the smaller column in the spout; and in the hydrostatic bellows, a few ounces of liquid may be made to balance many pounds of solid matter.

Since the pressure upon any vertical enclosing wall must increase regularly with the depth, it follows that, in a filled cubical reservoir, the average pressure against any side is at half the depth; but this is also the depth of the centre of gravity of that enclosing surface. The whole pressure of the liquid against such vertical side is just half that on the base; and it is therefore proportional to the product of the area of the side into the depth of its centre of gravity below the liquid surface. Thus, the whole pressure received by the sides and bottom of a filled cubical reservoir is 3 times that on the bottom, *i. e.*, 3 times the weight of the contained liquid. In case a lateral wall is inclined in either direction, and in case of an inclined or horizontal bottom, the law above given still holds true, viz., the whole pressure on any such surface is equal to that on a horizontal surface having the same area, and whose depth is the perpendicular depth of the centre of gravity of the surface considered below that of the liquid in such reservoir. If a distant body of liquid, as that in a larger reservoir, communicate by pipes with the confined body of liquid under consideration, and have a higher level, the principle is still the same; the depth in this case is that below the highest liquid surface; so that, in every case, the pressure on a surface will be determined by its area and the entire perpendicular depth of its centre of gravity, not by the shape, size, or connections of the containing vessel. From the increase of lateral pressure with depth, or "head of water," follows the necessity of making dams, flood gates, and locks proportionally more strong as they descend below the water surface; and from the relation of pressure to the amount of surface, as well as owing to the principle of the arch, the greater relative strength and economy of cylindrical over prismatic tubes for conveying liquids. The actual pressure on a horizontal square foot at 1 foot depth in pure water, is the weight of a cubic foot of water, viz., 62.3232 lbs.; at a depth of 2 feet, double this; and proportionally for all depths. At great depths, this pressure becomes enormous; and though it is doubtful whether it materially increases the density or lessens the mobility of water, even at the bottom of the deepest parts of the ocean, it produces many other and obvious effects. Sunken ships have the air in the pores of the wood displaced by the water, become relatively heavier than water, and refuse to rise. The side or bottom of a ship being broken in or perforated in any way, water rushes in with a force proportional to the depth of the opening, so that it is usually quite impracticable successfully to oppose a resistance to it from within. The liquid within the bodies of fishes, or in the human body, balances at moderate depths the pressure of the superincumbent mass, and by itself would do so at any depth; but at great depths the delicate membranes or vessels of the body give way owing to compression from without or displacement of their fluids, and hence divers, as well

as fish, can descend to limited depths only; the latter can descend 150 feet, but do not usually more than 100 feet. Pipes for the conveyance of water in cities suffer a pressure on the square inch of about $4\frac{1}{2}$ lbs. for every 10 feet of descent below the level of water in the reservoir, and require to be made correspondingly strong. The outward pressure upon the lower third of one side of a filled cubical box is just equal to that upon the upper two thirds; hence, the middle point of a horizontal line at $\frac{2}{3}$ the depth, in this case, will be the point at which a force could be applied from without so as exactly to sustain the whole pressure of the liquid from within, and to keep the side, if detached from the vessel, in exact equilibrium. This point is therefore the centre of pressure, a point that can be found for a surface of any shape or size, and that is of considerable importance in the practical business of opposing support to or confining liquid bodies. From the relation of liquid pressures to depth it follows also that liquids in different vessels, in bodies of any form, or in different parts of the same body, if free to move, can be in equilibrium and at rest only when their several surfaces stand at the same level. In consequence of the equality of upward to downward pressure at any given depth in their mass, liquids exert a buoyant or supporting power on all solids immersed in them. When an egg floats in the middle of a quantity of the lye of ashes, neither rising to the surface nor sinking to the bottom, it is because the density or specific gravity of the egg is just equal to that of the liquid. Any solid displaces its own volume of liquid; if then, in the case given, the density of the former be equal to that of the latter, the downward pressure which acts at the under surface of the egg is just equal to the upward pressure on the same surface due to the weight of the columns of liquid around it reaching to the same depth, and the egg is in equilibrium and at rest. But suppose the liquid made denser; the surrounding columns now weigh and press more than that containing the egg; the downward pressure at its under surface is less than the upward, and it is pushed up in consequence. If the liquid be made rarer, the egg must sink. This is true of any solid set free or immersed in a liquid; the solid will always sink or rise until the whole downward pressure acting on its under surface, and due to its own weight with or without the addition of a weight of liquid above it, is exactly equal to the whole upward pressure of surrounding columns, and which is greater the lower the body sinks. If the body be of less weight than its own volume of water, it must float; and it will sink until it has displaced a volume of water whose weight is just equal to its own. It is on this principle that the weight of boats or their cargo is found by the amount of displacement they cause within a reservoir constructed for the purpose. All the upward pressures acting upon the bottom of any floating body, as a ship, combine so as to give a single resultant pressure acting vertically

upward; and the point at which this is in effect applied to the floating body is that of the centre of gravity of the previous mass of liquid, now displaced. This is for the floating body the centre of buoyancy; and the degree of support the body receives is termed its buoyancy. Glass or iron floats on quicksilver, but sinks in water; and some kinds of wood which float on water sink in oil or alcohol. The buoyancy of a body may be increased by incorporating or connecting with it bodies or tight spaces, having a certain volume with very small density. Thus, the human body is made more buoyant by an attachment of inflated bags or other contrivances, known as life preservers; empty boxes, termed "camels," are used to lighten ships over shoals, or to raise those that are sunk, being first let down filled with water, attached to the sides of the body to be lifted, and then exhausted by pumping, while air is allowed to enter. This is also the philosophy of the life boat, and of the recently invented diving engine, the nautilus, which rises or sinks in water according as certain chambers are filled with air or water, just as fish ascend and descend by inflating or emptying the air bladder. In fact, it is upon the principle now stated that the materials of wooden or iron ships can be made buoyant; the air filling their hold, like that in a caldron kettle floating on water, is really, so long as the water cannot enter to displace it, incorporate with the solids in a single body, and gives levity to the whole. Floating bodies may have equilibrium of three kinds: 1, neutral, or indifferent equilibrium, when the centre of gravity of the solid is at the same point with the centre of buoyancy, and the solid will rest indifferently in any position; 2, ordinary stable equilibrium, when the centre of gravity is below that of buoyancy, and the body can oscillate about its position, like a pendulum, but does not easily overturn; 3, unstable, when the centre of gravity is above, and the least inclination must overturn the body. But in a body floating as a ship and oscillating by winds or waves, mathematical analysis discovers a third point, above the centre of buoyancy, which, through any ordinary swing of the ship, keeps its place at every moment in a vertical line over the changing centre of the displaced liquid; this is called the meta-centre, and its peculiarity is, that if the centre of gravity of the ship and cargo be kept below it, even though above that of buoyancy, the ship still possesses stable equilibrium, righting itself after ordinary disturbances of position. A ship is thus rather a supported than a suspended body, and yet enjoys a good degree of stability; indeed, if the centre of gravity be too much depressed, the oscillations of the hull are unfavorably increased in sweep. II. HYDRODYNAMICS, or HYDRAULICS. Under this head three general cases are to be considered: that of liquids issuing from orifices; their flow through tubes, or in streams; and the effects of the momentum and impact of liquids, including the case of

bodies moving through them. If an orifice in a vessel present downward, and the column of liquid over it be short, this will simply drop out by its own weight, starting at a velocity of 0. But if a considerable depth of liquid be above, its gravity produces a corresponding pressure on its base, or on that liquid which is near it; so that, if a plug be removed from an orifice in or close to the base, the liquid starts at once into rapid motion. Theoretically, the velocity with which it thus starts to move is equal to that which a body would acquire in falling freely, *in vacuo*, from the surface of the liquid to the centre of the orifice. If this depth be 16 feet, the initial velocity will be 32 feet per second, and so on. The velocity is independent of the density of the liquid, being determined solely by the depth below the surface; and it is proportional to the square root of the depth, being 5 times as rapid at a depth of 25 feet as at 1 foot. If the liquid in the vessel be kept at the same level, the quantity discharged in a given time will be in theory equal to the product of the area of the cross section of the escaping jet at the orifice into the length of jet delivered. The time required by a vessel to empty itself is to the time required, when it is kept constantly full, to discharge the same quantity of water, as 2 to 1; and the spaces described by the surface in its descent in a column of equal size throughout, are as the odd numbers, * * * 9, 7, 5, 3, 1. Thus, these spaces measure equal times, as in the clepsydra, or water clock. Since liquids are not perfectly mobile, and their exit at an orifice must be retarded by cohesion and friction, the results thus far given are much modified in practice. When a liquid flows through an orifice in a vessel, eddies are formed about the sides of the orifice, preventing the escape of a jet equivalent to its full size; and owing to these, and to acceleration of velocity, if the jet be downward, it rapidly contracts in its diameter. At a distance outside about equal to the diameter of the orifice, it is contracted to $\frac{2}{3}$ or $\frac{5}{8}$ its area at first; and this part has been called the "contracted vein." Savart has shown that below this the stream still contracts, though less rapidly. Through a certain length the jet seems to remain entire and pellucid; but it soon becomes turbid, being broken into drops in a series of layers. Savart also found that these alternately flatten laterally and elongate, forming what he has called ventral segments and nodes. These layers separate more widely as they descend with increased rapidity; but falling through great heights, the whole may finally be dissipated in a mist. The formation of the drops doubtless takes place in consequence of pulsations in the liquid, originating at the moment of its passage through the orifice. In this view the most recent and careful investigator of the subject, Plateau ("Philosophical Magazine," Oct. 1856), essentially coincides. A musical sound is produced at the orifice, and undoubtedly by the action of molecular forces similar

to those which determine the "singing" of burning jets of gas. Owing to disturbing influences such as those now named, the actual efflux of a liquid is always much less than the theoretical. Through a thin wall not more than 15 feet in depth, the former is only about 64 parts in 100 of the latter. A short pipe inserted so as to reach within the orifice diminishes the flow; not reaching within, and having a length of twice its diameter, it increases the efflux to 82 parts; having the form of the contracted vein, to 95 parts; and when the sides of the vessel approach the tube within in paraboloid form, and the tube itself is trumpet-shaped, the discharge may equal or exceed that required by theory. Liquid jets from the sides of vessels may be considered as discharges of continuous bodies of projectiles (drops) slightly held together by cohesion. In practice, such a jet directed upward falls considerably short of reaching the height of the liquid surface in the vessel or reservoir. When the jet is directed horizontally it tends, but for the resistance of the air, to describe a curve in form of a parabola. All the results now stated are further modified in those semi-liquids which have greater or less viscosity, as sirup, fixed oils, &c.—In theory, cylindrical tubes of the same length, having their diameters as 2 to 1, should deliver in the same time quantities of liquid that are as 4 to 1; and generally, the quantities will be as the squares of the diameters. But owing to the fact that the friction is relatively greater the smaller the tube, it results in practice that two tubes will not deliver quantities that are as those squares, but the larger will afford proportionally more. Under the same conditions, a tube 70 yards long of the same size with another that is 1 inch long, will deliver only about $\frac{1}{2}$ the quantity of liquid; two pipes of 2 and 1 inch diameter, 100 feet long, yield quantities as 5 to 1, not as 4 to 1; and to secure a given discharge by a long pipe, its diameter must usually be $\frac{1}{2}$ greater than that required by theory. In tubes of unequal size in different parts, and kept filled, the flow is somewhat quickened at the contracted portions so as in a degree to compensate for loss of capacity; if any portion is greatly enlarged, eddies are formed in it, and the flow is retarded; as it is also by greatly diminishing the caliber, as is done by cocks, and in aeriform fluids by dampers. If a single pipe terminate in several smaller ones, the velocity in the smaller is less, unless their collective area be made as much larger than that of the single one as the friction arising within them is greater; a principle well illustrated in the case of arteries and capillaries in the animal body. And any pipe will deliver in a given time a quantity of liquid that is greater in proportion as its inner surface is smooth; as the liquid is one having less adhesion for the pipe; as the head of water and rapidity of descent of the pipe are increased; as the bore is more nearly uniform; and as the curves in its course are more gradual, or its direction approaches a straight line. Singularly, too, even

with long tubes the amount delivered is increased by shaping the exit of the reservoir into the tube in form of a paraboloid, and still more by terminating the tube in a conical opening, enlarging outward. If a current of water be sent through a cistern, the cohesion of the water will draw along with it that on either side, until the contents of the cistern will stand at a lower level than the stream itself; and Venturi, who discovered this fact, availed himself of it to drain a marsh near Modena, by turning through it a neighboring rapid stream. So, Magnus found a jet of about $\frac{1}{2}$ inch diameter directed upward through a spout of $\frac{1}{2}$ inch diameter in a reservoir to arrest in a degree the escape of liquid around it, and maintain the level within at some 10 inches above the orifice.—The force of impact between a liquid and a solid body moving in or against it, may arise from motion of either, or of both, and in the same or in opposite directions. If one only be moving, the resistance or impact is generally stated as the square of its velocity; if both, in opposite directions, as the square of the sum of the velocities; both in the same direction, as the square of the difference. A body having 1 square foot of surface, at right angles to its course, and impelled forward just below the surface of water with the velocity it would acquire in falling the first second ($2 \times 16\frac{1}{16}$ ft.=a uniform velocity of 386 inches per second), will meet with a resistance equal to the weight of a column of water 198 inches in height and of 1 square foot base, *i. e.*, about 1,003 lbs. This may be taken as the unit of resistance in such cases; but the resistance must be proportionally increased for greater depths, and calculated on the principle of resolution of forces, when the solid, like the bow of a ship, presents its surface obliquely, not at right angles to the liquid body to be displaced. At very great velocities, however, the resistance is found practically to be increased in much higher than the duplicate ratio above given; and owing to the mobility of water, long tapering bows, which give time for the gradual displacement of the liquid, do not experience, in proportion to that felt upon those more square-built, even the full theoretical resistance due to the amount and obliquity of surface they present.

HYDROMETER (Gr. *ἵδωρ*, water, and *μετρον*, measure), an instrument for determining the specific gravities of fluids, the principle of which has already been explained under **AREOMETER**. A variety of these instruments have been introduced in different countries. Baumé's is generally recognized in the United States, and on the continent of Europe is much used, especially for liquids heavier than water. It is made of two sorts, one for liquids lighter, and the other for those heavier than water, and of these there are varieties for special liquids. For acids or salts the instrument is graduated by sinking it first in pure water, and ballasting it so that the water line shall be near the top of the stem. This fixes the zero point. It is then floated in

a solution of 15 parts by weight of dry common salt in 85 parts of distilled water; and the point cut by the water line is marked 15°. From these the whole stem is divided into degrees, which should reach to 66° for sulphuric acid. The greater the degree indicated in its use, the more dense is the fluid. For spirituous liquors the zero point upon the stem is determined from a solution of 10 parts of dry salt in 90 of water, in which nearly the whole of the stem should be out of the fluid. The 10° point is given by pure water, and the degrees are from these marked upward, even to 70° for sulphuric ether; the larger the degree indicated the lighter is the fluid. Instruments for special uses are made from these, but with short range adapted for their particular service. The specific gravity of a liquid is ascertained from the indication of the hydrometer of the first class by the formula, $g = \frac{152}{152-d}$; and of the 2d class, by $g = \frac{146}{136+d}$; *d* being the degree given by the scale. But tables are prepared for convenient reference.—Cartier's hydrometer is also much used in commerce, especially by the French. It is made by adopting the 22° point of Baumé, and dividing the 16 degrees on each side of this into 15 equal degrees. The degrees of Cartier (C.) are converted into those of Baumé (B.), and reciprocally, by the formula, $16C = 15B + 22$; whence the specific gravity, *g*, corresponding to C. degrees $= \frac{136.8}{120.1+C}$. The hydrometers of Baumé and Cartier are based on a temperature of 12.5° cent. (54.5° F.); and when used for a liquid at a different temperature, allowance is to be made, as given in the tables.—In Great Britain, Twaddell's hydrometer is in general use for dense liquids. It is so graduated that the specific gravity may be deduced by multiplying the degree indicated by 5 and adding 1000, water being reckoned 1000; thus 12° Twaddell indicates a specific gravity of 1060 or 1.06.

HYDROPATHY (Gr. *ἵδωρ*, water, and *παθος*, affection or disease), a system of treatment of diseases mainly or exclusively by the use of water and of the known hygienic agencies. Hygienic management in some form, as a resort to exercise, or, in diseases induced by luxurions living, to abstinence, dates from the earliest conception of a healing art; and it has kept pace with the growth of physiological science, until within the present century the laws and claims of hygiene have become appreciated as never before. The physicians of very early times seem also to have employed water as a remedy in certain febrile, inflammatory, and surgical maladies; a usage recommended, among other early medical writers, by Hippocrates, Galen, and Avicenna. In the 18th century Sir John Floyer and Dr. Baynard, in England, resorted to bathing almost exclusively in chronic diseases; as did F. Hoffmann and Hahn on the continent. Dr. James Currie in 1797 published highly favorable reports of the effects of water, chiefly by affusion, in many diseases. But the distinctive "water cure," or hydrotherapy, owes

its origin to the fertility of invention of a Silesian peasant, Vincent Priessnitz. Having at the age of 13 sprained his wrist, young Priessnitz intuitively applied it to the pump; and afterward, to continue the relief thus obtained, he bound upon it an *Umschlag*, or wet bandage. Rewetting this as it became dry, he reduced the inflammation, but excited a rash on the surface of the part. Soon after, having crushed his thumb, and again applying the bandage, the pain once more subsided, but the rash reappeared. He inferred that the rash indicated an impure blood; and this conclusion was strengthened by the result of experiments which he was induced to try upon injuries and ulcers in the case of some of his neighbors, since the rash in some instances appeared after the treatment, and in others did not. Thus he was led to frame for himself a humoral pathology of all diseases, and a doctrine of the elimination of morbid matters by "crisis." According to this view, the cure of disease is to be effected by favoring the activity of those organs through which the purification of the system is carried on, and, through a regulated and pure dietary and correct regimen, preventing further morbid accumulations. In his 19th year, being run over by a cart, Priessnitz had some ribs broken and received severe bruises; on learning that the physicians pronounced his case hopeless, he tore off their bandages, and recovered under the renewed application of the *Umschlag*, and replaced his ribs by inflating the lungs while pressing the abdomen against a window sill. This incident confirmed the idea and inaugurated the practice of the water cure. In the new practice, its author discovered in rapid succession the means of securing either cooling, heating, or soothing effects by compresses; then, the sponge bath, the wet-sheet packing, the sitz, foot, arm, and other partial baths, the douche, the stream bath, the dripping sheet, the plunge, the tepid shallow bath, dry-blanket packing, &c. The pail douche of Dr. E. Johnson is one of the very few additions since made to this list of measures. Unquestionably, Priessnitz's earlier treatment, especially after the opening in 1829 of the famous Gräfenberg cure, was too incessant and severe, and often borne only through the vital tenacity, whatever their maladies, of the class of invalids with whom he had to deal. Along with this was introduced a rigorous, but in some respects mistaken hygiene, including the very free use of a plain and peculiar diet, much walking in the open air, and the disuse of flannel undergarments and of soft beds. The water appliances have since been rendered more mild, and in the United States necessarily so. The number of instances, however, of decided restoration to health among the invalids (many of them afflicted with the worst forms and complications of disease, and abandoned to incurability by the prevalent medication of the day) who flocked from all parts of Europe and of the United States to the Gräfenberg cure, sufficiently explains the rapid

spread of the new system. This was first distinctly brought to the notice of the English public about the year 1840, by a book put forth by a former patient of Priessnitz, Capt. Claridge, and entitled "Hydropathy, or the Cold Water Cure." In Germany, under Francke, Weiss, Munde, and others, the enthusiastic treatise of the first of whom did much to spread the system, several new establishments had already sprung up. On March 17, 1842, the hydro-pathic society was formed in London, for the purpose, among others, of collecting information in regard to Priessnitz and the authenticity of the reported cures. Drs. Wilson, Johnson, and Gully were first to embrace the practice, the first two early lecturing before the new society, and all soon establishing institutions of their own. The writings of Drs. Gully and Johnson contributed much to spread the system in England, and at a later day they were ably seconded by Bulwer's "Confessions of a Water Patient," detailing incidents of his restoration to health at the Malvern establishment. The earliest popular information concerning water treatment in the United States was through a letter published about 1843, from H. C. Wright, himself at the time a patient under Priessnitz; and this was soon followed by the earnest statements and appeals, through a like channel, of J. H. Gray of Boston and A. J. Colvin of Albany. Drs. Schiefferdecker, Wesselhoeft, and Shew seem to have been the first to enter upon the new practice in the United States; while the first establishment appears to have been that opened in 1844 at No. 63 Barclay st., New York. Of this, David Cambell, also the originator of the existing "Water-Cure Journal," was proprietor, and Joel Shew physician. Early in May, 1845, was opened the establishment at New Lebanon Springs, N. Y., under Dr. Shew, and the more widely celebrated one at Brattleborough, Vt., under Dr. Wesselhoeft. The latter, having explored the country from Florida to Maine, selected Brattleborough on account of the superior purity of the water of a spring there. Probably there are at the present time, scattered throughout this country and Europe, more than 200 establishments of this kind. Several works relating to hydropathy, and of interest in a practical point of view, have been issued in the United States, especially by Drs. Shew and Trall; but in this respect the practice experiences the want, incident to the infancy of almost all systems, of a comprehensive and philosophical exposition of its principles and their application. A school in the city of New York teaching the doctrines of this system, perhaps the only one now in existence, received a charter from the state legislature in 1857.

HYDROPHOBIA (Gr. ἵδωρ, water, and φοβέσθαι, to fear; Lat. *rabies canina*, canine madness). This appalling disease has been long known. Homer speaks of madness occurring in dogs. Aristotle denies that man is ever affected by it, but soon after it was described as occurring in man; and from that time to this

notices of it abound among medical authors. The disease is propagated by the dog, the wolf, and the jackal; the cat likewise is capable of communicating it; and Youatt gives an instance in which a groom, whose hand was scratched by the tooth of a horse laboring under it, became affected with hydrophobia. Man and most if not all of the domestic animals are capable of contracting the disease, but whether they are capable of communicating it is still undecided. For man to contract it, the saliva of the mad dog must be applied either to a mucous membrane or to an abraded surface; the mere contact of the poison with the unbroken skin will not, except under very rare circumstances, produce the disease. The period that elapses between the reception of the injury and the outbreak of the disease varies exceedingly; the greater number of cases occur between the 30th and the 59th day; some have occurred earlier, and a few as late as 6, 7, 9, and even 19 months after the reception of the wound; in the one or two instances on record in which a still longer period has elapsed, the patient has probably been reinoculated with the virus. The first symptom which attracts the attention of the patient is pain or some uneasy sensation in the cicatrix of the original wound, which extends toward the trunk. The wound itself sometimes becomes red, livid, or inflamed, or it may open afresh, discharging a peculiar ichor. This is the period of recrudescence, and though not always noticed occurs probably in every case. Commonly within 2 or 3 days after this stage of recrudescence, rarely later than 6, during which period the patient remains ill and uncomfortable, the 3d and final stage of the complaint commences. A feeling of painful stiffness occurs about the back of the neck, extending to the base of the jaw and root of the tongue; the breathing is hurried, and sighing is frequent; the patient finds himself unable to swallow fluids, every attempt to do so bringing on a fit of the most distressing sobbing and choking; during this paroxysm the muscles of the mouth and pharynx are seen to be spasmodically contracted. The patient is tormented with thirst, and the paroxysms are often excited by the sight or sound of water; even a polished surface or a current of air is sometimes sufficient to bring them on. The mind seems excited; the patient appears alarmed, is anxious, irritable, and suspicious; often a degree of delirium or mania supervenes. He is annoyed by the secretion of a thick viscid saliva, and tries to free himself from it by blowing and spitting. Vomiting of a yellow or greenish matter is often present, sighing is frequent and peculiar, and the pulse rapidly becomes weak and frequent. Death commonly takes place on the 2d or 3d day, though it has happened within 24 hours, and has been delayed to the 9th day. In some few cases, toward the close of the disease, a remission of the symptoms takes place, when the patient is able to eat and drink, and appears composed; in this condition he may sink into a sleep which is but the precursor of death, or

he expires in a sudden and general convulsion. Examination after death throws no light on the phenomena of hydrophobia. There are no appearances found peculiar to it. Evidences of inflammation of the œsophagus, pharynx, and larynx are commonly present, but they are results rather than causes of the disease.—It has been maintained, and is still maintained by some authorities, that there is no such disease as hydrophobia, and that the phenomena are caused by fear acting on a sensitive organization. The uniformity of the symptoms, the effect of the poison upon other animals, and the occurrence of the disease in infants and idiots, refute this hypothesis. Hysteria sometimes imitates hydrophobia, as it does every other disease, and apprehension has reproduced some of its symptoms, but these cases can readily be discriminated. Some well authenticated cases are on record where the disease has occurred and proved fatal, and yet in which the patient had not been bitten by a rabid animal, so that a hydrophobia of spontaneous origin has been admitted by most authorities; but in these rare cases may not the origin of the inoculation have escaped notice? Some singular instances are related by Mr. Youatt of the mode in which the poison may be propagated. A man was observed attempting to untie a knot in a cord with his teeth; two months after he perished of hydrophobia. The cord had been used to tie up a mad dog. A woman had her dress torn by a mad dog, and in mending it she pressed the seam with her teeth and was inoculated. Of a number of persons bitten by a rabid dog, how many will be attacked with hydrophobia? J. Hunter says that in one instance of 21 persons bitten only one was attacked. Dr. Hamilton thinks the proportion is 1 in 25. In a case that occurred near Senlis in France, where by the order of the government the most accurate inquiries were made, out of 15 persons bitten 5 were attacked. The bite of the rabid wolf seems more fatal than that of the dog; thus out of 114 persons bitten by rabid wolves 67 died.—When hydrophobia is characteristically developed, the patient dies; there is no authenticated case of cure on record. By the use of chloroform and narcotics we may relieve the agony of the patient, but that is all. As a prophylactic, the only sure means is the complete excision of the part bitten. To accomplish this, Abernethy recommends that a bit of wood sharpened to a likeness of the dog's tooth be thrust into the part and then cut out without the knife's coming in contact with the wood. Where this will not be permitted, caustics may be liberally employed, and of these the best are perhaps nitric acid and strong liquid ammonia. Mr. Youatt uses lunar caustic with success.

HYDROSTATICS. See HYDROMECHANICS.

HYDROSULPHURIC ACID, SULPHYDROIC ACID, or SULPHURETTED HYDROGEN, a gaseous compound first examined by Scheele in 1777; symbol, SH ; chemical equivalent 17. It consists of two volumes of hydrogen and one of sulphur

vapor condensed into two volumes, which form its combining measure. Its density is 1191.2, air being 1000. It is a colorless gas, has a slight acid reaction, and a most offensive odor, recognized in rotten eggs, dock mud, cesspools, many mineral waters, and putrefying organic matters containing sulphur. It extinguishes flame, but burns itself in contact with air with a blue flame, depositing sulphur. It is condensed by a pressure of 17 atmospheres at 50° into a colorless liquid, and was solidified by Faraday by cooling to -122° into a white crystalline translucent substance. Water absorbs $2\frac{1}{2}$ times its volume of the gas; alcohol 6 volumes. It blackens the salts of lead and of many other metals, forming sulphurets of the metals. These being insoluble and made readily visible by their peculiar colors, even in minute quantity, the acid is a convenient test for determining the presence of the metals in solutions, and distinguishing them by the color of the precipitate and its other properties. Its aqueous solution and its solution in ammonia (hydrosulphuret of ammonium) are among the useful chemical reagents. The gas is exceedingly noxious to inhale. Thénard found that a small bird would die in air containing $\frac{1}{1300}$ part of it, and a horse in air that contained $\frac{1}{250}$ of the gas. It is also stated that fatal accidents have occurred to grave diggers by this gas suddenly issuing from coffins exposed in digging; but these may possibly have been owing to carbonic oxide, which is more sudden in its effects upon animal life than other gases. The gas is neutralized and decomposed by chlorine and iodine, which unite with its hydrogen; and the former, furnished by chloride of lime wet with strong vinegar, is a convenient antidote and disinfectant of the gas. Nitrate of lead, chloride of zinc, sulphate of iron, and sulphate of manganese are also efficacious in this respect. The presence of the gas is detected by its odor, and by its blackening a paper wet with a solution of acetate of lead. It is the cause of the discoloration of white lead paint in the apartments of houses, also of the blackening of silver spoons when these are used with boiled eggs, the albumen of the white of the egg furnishing the sulphur for the production of the gas.—To prepare hydrosulphuric acid, the ingredients employed are a protosulphuret of iron, made by exposing to a low red heat 4 parts of coarse sulphur and 7 of iron filings, and diluted sulphuric acid. By pouring the acid upon broken lumps of the former compound placed in a gas bottle, the gas is evolved, and may be collected in a bell glass over water at 80° or 90°, or over brine. It is absorbed by cold water. It may also be obtained by the action of hydrochloric acid upon tersulphuret of antimony. The reactions in each case are thus expressed: $\text{FeS} + \text{HIO}$, SO_2 yield FeO , $\text{SO}_2 + \text{SH}$; $3\text{HCl} + \text{Sb}_2\text{S}_3$ yield $\text{SbCl}_3 + 3\text{SH}$.

HYDRUNTUM. See **OTRANTO**.

HYÈRES, a town of France, in the department of Var, on the S. declivity of a hill, 11 m. E. of Toulon, and 3 m. from the Mediterranean;

pop. 9,966. The principal edifices are: the old church, one of the most singular structures in France; and an ancient chateau, now used as a town hall. In the principal square is a column, surmounted by a white marble bust of the celebrated Massillon, who was a native of the town. Hyères is considered one of the healthiest winter residences in the S. of France, and is much resorted to by invalids. Remains of an ancient Roman city exist in its vicinity. In the roadstead opposite the town, and belonging to it, is a group of small islands called the isles of Hyères, two of which are fortified.

HYGIEIA, or **HYGEA**, in Greek mythology, the goddess of health, and a daughter of Æsculapius. She was represented by artists as a virgin in flowing garments feeding a serpent from a cup; the poets speak of her as a smiling goddess with bright glances, and a favorite of Apollo. By the Romans she was in time identified with the old Sabine goddess Salus.

HYGROMETRY (Gr. *hypos*, moist, and *μετρον*, measure), the method of determining the amount of moisture in bodies, more especially in atmospheric air. A hygrometer is an instrument used for this purpose; and a hygroscope is any substance that absorbs moisture from the air, and is in consequence changed in form or weight. Various salts absorb moisture and deliquesce, and are consequently called hygroscopic. These serve as hygrometers in chemical analysis; thus chloride of calcium placed in a glass tube absorbs the moisture from the air passed through the tube, and its increase of weight determines the quantity. The property is exhibited in hemp and cotton ropes, and in small fibres, as those of whalebone, and in hairs. Paper by absorption of moisture expands to such a degree that it is an imperfect material for preserving accurate plans. Its variation in length in extremely dry and in moist air sometimes exceeds 1 in 40. If a substance could be found which absorbed moisture in proportion to the quantity in the air, and its form was proportionally affected thereby, this change could be readily indicated upon a dial, the extreme points of which are determined, the one by the least length produced by the greatest dryness, and the other by the greatest elongation caused by the most humid air that could be produced, the intermediate space being divided into 100 or other convenient number of degrees. Such an instrument would be a perfect hygrometer; but no such substance is known, and the properties of the same body in this respect are not constant at all times. The best instrument of this sort, which is after all only a hygroscope, was contrived by De Saussure. It is a human hair, cleansed by boiling in alkaline water. The zero point of the scale to which it is attached is fixed by drying the hair in air rendered by chemical absorbents as dry as possible; and then, by exposing it in a receiver to air saturated with moisture, the other extreme of the scale is found. The equal divisions between these are assumed to indicate proportional degrees of moisture or dryness. One end of

the hair is fixed, and to the other is suspended a small weight. A grooved wheel or pulley carrying an index is placed so as to be moved by the hair as it contracts or expands. Various other hygrometers of this class have been devised, some on the principle of determining the moisture by the increased weight imparted to bodies by its absorption, and others by the torsion thereby induced in cords and in vegetable fibres; but all these methods have proved very imperfect.—Two other methods are to be noticed by which the humidity of the air is ascertained. The first depends on the determination of the dew point, or the degree of temperature to which the air must be reduced that its moisture shall begin to separate and condense upon cold surfaces. This difference alone is sometimes used to express the dryness of the air, as affording an indication of how near it is to its point of saturation. In temperate regions this sometimes amounts to 30° ; but in a dry and hot climate, under the lee of cold mountains which first strip the air of its moisture, it amounts to 60° or more; such is the case upon the hot plains of the Deccan, to which the air is brought from the other side of the Ghats. Cooled down upon these to a low temperature, its moisture is precipitated in rain and snow, and when immediately after this it is raised to a temperature of 90° , it is found that no deposition of moisture again takes place until the temperature is reduced to 29° . The observation, however, is used to furnish more exact results. Tables have been prepared with the utmost care which give the elastic force of aqueous vapor at different degrees and even tenths of degrees of temperature, expressed in the height of a column of mercury the vapor sustains. The temperature of the dew point of the air being ascertained, the elastic force corresponding to this temperature in the table represents the absolute humidity of the air, and may be converted into the actual weight of moisture to the cubic foot under a given barometric pressure by the formula prepared for this purpose, or directly by the tables constructed to reduce the labor of the calculation. By comparing the elastic force obtained from the table with that corresponding to the temperature of the air itself, the ratio between the two expresses the relative humidity of the air. This also is ascertained at sight by the tables specially constructed for this object. The most highly approved hygrometrical tables are those derived from the experiments of V. Regnault, made by direction of the French government to determine the expansive force of steam at different temperatures, which is also that of the vapor suspended in the air at the same temperatures. These tables are published in Regnault's *Études sur l'hygrométrie*, in the *Annales de chimie et de physique* (1845); and formulae also are given from which other tables, beside that of the elastic forces, have been prepared by others. The most complete series of these is furnished in the volume of "Tables, Meteorological and Physical, prepared for

the Smithsonian Institution by Arnold Guyot, P.D., LL.D.," and published in the "Smithsonian Miscellaneous Collections," 1858. In the same series is also presented the table of elastic forces of vapor deduced from the experiments of Dalton, together with others based upon it, and in general use in England. These are also found in Glaisher's "Hygrometrical Tables" (London, 1847), and in the Greenwich volumes.—Various forms of the dew point instrument or hygrometer have been devised. That of Prof. Daniell, which has been much used, is of the following construction. A bent tube, blown out at each end to a bulb, is laid across the top of a pillar, which serves as a stand, the two bulbs hanging down one on each side. One tube is long enough to contain a delicate thermometer, the bulb of which terminates in some ether contained in the external bulbs. By boiling the ether before closing the tube the air is nearly expelled. When in use the empty bulb is covered with a piece of muslin, which is kept wet with ether. The evaporation of this condenses the vapor within, causing the liquid in the other bulb to evaporate and grow cool. The bulb becomes at last sufficiently cool for the moisture to condense upon it, and the instant this makes its appearance in the form of a ring of dew encircling the bulb at the level of the surface of the ether, the temperature is to be noted by the thermometer within, while that of the air is observed upon another thermometer attached to the stand. Another observation of the enclosed thermometer is made as the dew disappears by the bulb returning to its former temperature; and the mean of the two observations will give a close approximation to the dew point.—A better instrument is that of Regnault. Two glass tubes are suspended by a small tubular arm near the top of each, both opening into the hollow stand that supports the tubes. A pipe for exhausting the air by means of a sort of bellows or the flow of water connects with the hollow in the stand by an opening near its base. The two tubes are closed, each with a cork through which a thermometer tube is fitted, the bulb in one reaching nearly to the bottom. Over the lower end of this one a very thin and highly polished thimble of silver nearly 2 inches long is fitted, and a fine tube open at each end is passed through the cork, reaching from the external air nearly to the bottom of the tube. Ether is poured into this bulb, covering the lower end of the thermometer, and rising an inch or two higher than the upper edge of the silver thimble. To determine the dew point, the apparatus for exhausting the air from the hollow stand is set in action. This causes the air to pass through the fine tube, and bubble through the ether, keeping it in motion and taking up its vapor. The liquid, the thermometer bulb, and the silver coating of the tube equally feel the reduced temperature, and the instant this reaches the dew point, the whole surface of the silver is covered with moisture.

The temperature of the thermometer placed in the ether is then observed, while the other marks the temperature of the air. By stopping the current of air the temperature rises, and the moisture disappears from the silver. The thermometer is to be noted again, and the mean of the two observations taken for the dew point; or several trials may be made in rapid succession. To avoid affecting the result by the warmth radiated from the body, a small telescope may be used in reading the thermometer. The instrument has been modified by Prof. Connell in substituting for the tube a small flask of highly polished brass or silver, into the neck of which is secured an exhausting syringe.—The second of the two methods above referred to, by which the humidity of the air is ascertained, involves the determination of the temperature of evaporation; and the instrument used is the wet bulb thermometer or psychrometer invented by Prof. August of Berlin, and described in his work *Ueber die Fortschritte der Hygrometrie* (Berlin, 1830). It consists of two delicate thermometers placed near together. The bulb of one is covered with muslin, which is kept wet by water supplied from a vessel close by through capillary conduction. The instrument is placed in a light draught of air, and as evaporation goes on the mercury in the wet bulb thermometer sinks to a certain point; the temperature of both is then noticed. If the air was nearly saturated with moisture, the difference will be found to be very slight. The barometric pressure is observed at the same time, and data are thus afforded for calculating the elastic force of aqueous vapor in the air. The formula for this calculation, modified by Regnault, and the psychrometrical tables deduced from it, are given in the volume of tables referred to above, and are equally applicable to the estimation whether the dew point instrument or wet bulb thermometer be used. To render them more convenient, they have been converted by Prof. Guyot into English measures. The series also contains tables of the weight of vapors in a given space at different temperatures. The method by the wet bulb, though regarded as decidedly the most accurate means of determining the elastic forces of the vapor, and thence the humidity of the air, is still rendered somewhat uncertain in its results from the impossibility of keeping the wet bulb uniformly moist, and from other causes also.—The ultimate object of these hygrometrical investigations is, by enabling the meteorologist to ascertain at all times, in all localities, and at all accessible elevations, the true condition of the atmosphere as to moisture, to furnish him with accurate data for studying the laws which control its variations. Among the meteorological works which may advantageously be consulted, beside those already named, are Kömzt's *Lehrbuch der Meteorologie*, or the same translated by Charles Martius; Daniell's "Meteorological Essays;" and Blodget's "Climatology of the United States" (Philadelphia, 1857).

HYKSOS, or SHEPHERD KINGS, a pastoral Asiatic race who invaded and conquered Egypt at a remote period, computed by Bunsen at 2567 or 2477 B. C., by Wilkinson at 2240, 2173, or 2059 B. C., and by Lepsius at about 2000 B. C. The only detailed account of them that has reached us from any ancient writer is the following fragment of a lost work of the Egyptian Manetho (280 B. C.), quoted by Josephus in his reply to Apion: "We had once a king called Timæos, under whom, from some cause unknown to me, the Deity was unfavorable to us, and there came unexpectedly from the eastern parts a race of men of obscure extraction, who confidently invaded the country and easily got possession of it by force, without a battle. Having subdued those who commanded in it, they proceeded savagely to burn the cities, and razed the temples of the gods, inhumanly treating all the natives, murdering some of them, and carrying the wives and children of others into slavery. In the end they also established one of themselves as a king whose name was Salatis; and he took up his abode in Memphis, exacting tribute from both Upper and Lower Egypt, and leaving garrisons in the most suitable places. He especially strengthened the parts toward the east, foreseeing that on the part of the Assyrians, who were then powerful, there would be a desire to invade their kingdom. Finding therefore in the Sethroite nome a city very conveniently placed, lying eastward of the Bubastic river, and called from some old religious doctrine Avaris [or Abaris], he built it up and made it very strong with walls, settling there also a great number of heavy-armed soldiers, to the amount of 240,000, for a guard. Hither he used to come in the summer season, partly to distribute the rations of corn and pay the troops, partly to exercise them carefully by musterings and reviews, in order to inspire fear into foreign nations. He died after a reign of 19 years. After him another king called Baion reigned 44 years; after him another, Apachnas, 36 years and 7 months; then Apophis 61 years, and Jannas 50 years and one month; last of all Assis, 49 years and 2 months. And these 6 were their first rulers, always carrying on war and desiring rather to extirpate the Egyptians. Their whole nation was called Hyksos, that is, shepherd kings; for *hyk* in the sacred language denotes king, and *sos* is a shepherd in the common dialect, and hence by composition Hyksos. The before-named kings and their descendants were masters of Egypt for 511 years. After this a revolt of the kings of the Thebaid and the rest of Egypt took place against the shepherds, and a great and prolonged war was carried on with them. Under a king whose name was Misphramuthosis, the shepherds were expelled by him from the rest of Egypt after a defeat, and shut up in Avaris. Thutmosis, the son of Misphramuthosis, endeavored to take the place by siege, attacking it with 480,000 men. Despairing of taking it, he made a treaty with them that they should leave Egypt and

withdraw, without injury, whithersoever they pleased; and in virtue of this agreement they withdrew from Egypt with all their families and possessions to the number of not fewer than 240,000, and traversed the desert into Syria. Fearing the power of the Assyrians, who were at that time masters of Asia, they built a city in Judæa and called it Jerusalem." Josephus evidently meant it to be inferred from this narrative that the Hyksos and the Hebrews were the same; and he proceeds to say that the name Hyksos, though commonly interpreted shepherd kings, in reality meant shepherd captives, such as were his forefathers under the dominion of the Pharaohs "who knew not Joseph." But modern criticism has shown this interpretation to be altogether untenable, and admits no identity between the small tribe whom Jacob led into Egypt as peaceful guests and the powerful conquerors who overthrew the Egyptian monarchy in a campaign and held it in subjection for hundreds of years. It appears certain beside, from chronology, that the inroad of the Hyksos was long prior to the entrance of the Hebrews into Egypt. It has been conjectured, with some plausibility, that the Pharaoh by whom Joseph and Jacob and their pastoral followers were so kindly received was one of the shepherd kings; and that the subsequent Pharaoh, "who knew not Joseph," and persecuted the Hebrews, was one of the native kings who succeeded the expelled Hyksos, and who regarded the Hebrews with suspicion in consequence of the favor that had been shown to them by the shepherds and the similarity of their pursuits. The Egyptians so detested the Hyksos that no mention of their occupation of the country is found on the monuments. The inscriptions contain nothing whatever about them, and none of the names mentioned by Manetho have been found among the inscribed names of kings, though some Egyptologists have with more or less success attempted to identify two or three of the later monarchs with certain of the monumental names. It is a singular and unaccountable fact that neither Herodotus nor Diodorus nor any of the Greek or Latin historians, though some of them were well acquainted with Egypt, make any mention of the shepherd kings. Several recent Egyptologists have made from the monumental records discordant calculations of the duration of their empire. Wilkinson in his latest publications assigns 1548 B. C. as the probable date of their expulsion, after an occupation of 511 or 625 years. Bunsen, who makes their reign the middle of the 3 periods into which he divides Egyptian history, fixes the date of the same event also at 1548 B. C., and is of opinion that the Hyksos held Egypt under 43 kings for 922 or 929 years. The native king who finally expelled them he considers to have been Tuthmosis III. Of the origin and race of the Hyksos we have absolutely no materials on which to form a positive opinion. We can merely conjecture that they were either Arabs, who broke out

from their deserts and conquered Egypt, as their descendants did long afterward in the early days of Mohammedanism, or Tartars descending from their steppes like the Huns, Magyars, Mongols, and Turks, to ravage and occupy fairer lands than their own. The latter opinion finds a certain confirmation in the fact that all the Hyksos names mentioned in Manetho's relation can easily be traced in living roots of the Turanian languages. Thus the word Hyksos itself strikingly resembles the Magyar *csikós*, horse herdsman, the name of the fortified town, Avaris, the Hungarian names of places, Óvár (Old Castle), Újvár (New Castle), Óváros (Old Town), and Újváros (New Town), the name of King Apophis, that of the Magyar princely house of the Apafis, &c.

HYLAS, in Greek mythology, son of Theodamas, king of the Dryopes, and the nymph Menodice. Hercules, after slaying his father, adopted Hylas, and took him on the Argonautic expedition. When they arrived at Mysia, Hylas went to a neighboring well for water, but the naiads of that fountain became so fascinated with his beauty that they drew him into the water, and he was never seen more. When Hercules shouted for him the youth's voice was heard from the well like a faint echo; and he was so enraged at his loss that he threatened to ravage the country of the Mysians if they would not produce Hylas dead or alive. They sought him in vain, but ultimately instituted an annual festival, during which they roamed over the mountains calling out the name of Hylas.

HYMEN, in Greek mythology, the god of marriage. He was according to some a son of Apollo, and one of the Muses; but according to others he was originally a mortal, who, having rescued some Attic maidens from Pelagic pirates or other robbers, had his praises celebrated in token of gratitude in their bridal songs, which after him were called hymeneal songs. The practice of singing such songs at the nuptial season became in time universal, and the heroic youth was gradually elevated to the rank of a divinity. Hymen is represented in works of art as a tall handsome youth, carrying in his right hand a bridal torch.

HYMETTUS, a mountain range of Attica, forming the S. E. boundary of the Athenian plain. It consists of two summits, the N. or greater Hymettus, the apex of which is 3,506 feet above the sea, and the S. or lesser Hymettus, denominated Anhydrus, "the waterless," by the ancients. The honey of Hymettus was considered by the Greeks as inferior only to that of Hybla; and the excellence of its marble is a favorite theme with classic authors. The greater Hymettus is now called Telo-Vuni; and the lesser, Mavro-Vuni.

HYOSCYAMUS. See HENBANE.

HYPATIA, the most illustrious of the Neo-Platonic female philosophers, born in Alexandria about 370, killed in 415. She was the daughter of Theon, a distinguished mathematician and

astronomer, under whom she made great progress in geometry. She repaired to Athens near the close of the 4th century, and studied under Plutarch, the head of the Athenian school, who expounded to a small circle of disciples, one of whom was his daughter Asclepigenia, the Chaldean oracles and the secrets of theurgy. On her return to Alexandria, her talents, beauty, graceful eloquence, and modesty at once made her an object of admiration. She revived the languishing Neo-Platonic school of Plotinus, became its head, and expounded her doctrines before a numerous and enthusiastic auditory. Synesius of Cyrene, bishop of Ptolemais, acknowledged himself her disciple, and corresponded with her, addressing his letters *τη φιλοσοφῷ*. But both as a pagan and as a philosopher she is said to have provoked the hostility of Cyril, bishop of Alexandria. Not only her lecture room was thronged, but she was consulted by the most considerable persons of the city, among others by the prefect Orestes, who was at constant feud with the bishop. The city was a prey to the violence of parties, and it was to the influence of Hypatia that Cyril attributed the refusal of Orestes to come to a reconciliation. "Certain persons, therefore," says the ecclesiastical historian Socrates, "of fierce and over-hot minds, who were headed by one Peter, a reader, conspired against the woman, and observed her returning home from some place; and having pulled her out of her chariot, they dragged her to the church named Caesareum, where they stripped her and murdered her. And when they had torn her piecemeal, they carried all her members to a place called Cinaron, and consumed them with fire. This fact brought no small disgrace upon Cyril and the Alexandrian church." Cyril is accused by Theodoret of sanctioning this murder, but Cave regards it as incredible, though only on the ground of Cyril's general character. Hypatia was the author of two mathematical treatises, which are lost, and there remains from her only an astronomical table inserted in the manual tables of Theon. She is the heroine of one of Charles Kingsley's historical romances, which bears her name.

HYPERBOLA (Gr. *ὑπερβαλλω*, to transcend), one of the conic sections, produced when the cutting plane makes a smaller angle with the axis of a right cone than is made by the side. The shadow of a globe on a flat wall, when part of the globe is further than the luminous point is from the wall, gives a hyperbola. Hyperboloids are surfaces generated by the motion of hyperbolas.

HYPERBOREANS, a legendary race, placed by the Greeks in the remote regions of the north, beyond the domain of Boreas or the north wind. They were unknown to Homer, and first appear in Hesiod and in the traditions connected with the temples at Delphi and Delos. The poets and geographers conceived of them as a pious nation, dwelling in perpetual sunshine, possessing abundant fruits, abstaining from the flesh of animals, and living for a thousand years

in innocence and peace, in the service of Apollo, delighted by dances and music. Humboldt finds in the legend "the first views of a natural science which explains the distribution of heat and the difference of climates by local causes, by the direction of the winds, the proximity of the sun, and the action of a moist or saline principle." The supposed location of the Hyperboreans changed with the progress of geographical knowledge. At first placed in the north at the sources of the Ister (Danube), they were transferred by some to the west when this river was supposed to proceed from the western extremity of Europe; while others transferred them to the extreme north of Europe, beyond the mythical Gryppes and Arimaspi, who themselves dwelt beyond the Scythians. The latter view at length prevailed; the character of the Hyperboreans as a sacred nation was lost sight of; and their name became only a geographical expression for the extreme north.

HYPERIDES, one of the 10 Attic orators, born probably about 395 B. C., died in Ægina in 322. He was a pupil of Plato in philosophy, of Isocrates in oratory, began his career as an advocate, and was an associate of Demosthenes as leader of the anti-Macedonian party. In 338 he and his son equipped two triremes at their own expense to join the expedition against Eubœa. He displayed an equal interest in the patriotic cause on an embassy to Rhodes (346), in the expedition against Byzantium (340), as ambassador with Demosthenes to Thebes after the capture of Elatea by Philip (338), and after the battle of Chæronea, when he proposed, by a union of the citizens, resident aliens, and slaves, to organize a desperate resistance to Philip. For his efforts on the last occasion he was prosecuted in an indictment for illegal proposition, but was acquitted. Of his defence there remain only the words: "The Macedonian army darkened my vision; it was not I that moved the decree, but the battle of Chæronea." The affair of Harpalus (324) for the first time broke his friendly relations with Demosthenes, against whom he appeared as public prosecutor. On the report of Alexander's death (323), it was chiefly by his exertions that the confederacy was formed which brought about the Lamian war. He fled after the battle of Crannon to Ægina, and was pursued and put to death by the emissaries of Antipater. The ancient critics agree in extolling his genius, and commend him for almost every excellence of style. Until lately, however, only unimportant fragments of his orations were known to have been preserved. In 1847 A. C. Harris, an English resident at Alexandria, purchased at Thebes some fragments of papyrus written over with Greek, which were parts of the oration of Hyperides against Demosthenes on the charge of having been bribed by Harpalus. He published a facsimile of them in 1848. They were edited by Churchill Babington, with an introduction and commentary, in 1850. Another Englishman, Joseph Arden, procured at the same place and nearly the same time other

fragments of papyrus, which were found to contain a large part of his speech for Lycophron, prosecuted for adultery, and his complete oration for Euxenippus, charged with making a false report of the oracle of Amphiaraus. These were edited by Mr. Babington in 1853. Another traveller, Mr. Stodart, brought from Egypt in 1856 another collection of papyrus fragments, among which were a large part of the funeral oration on Leosthenes and the Athenian soldiers who perished in the Lamian war. This was published by the same editor in 1858. These works restore Hyperides to his place among the great Attic orators; and though his style does not equal that of Demosthenes in force, dignity, and careful preparation, its clearness, fluency, and eloquence justify the praises of the ancients. His orations have been republished in Germany by Böckh, Kayser, and others, and in Paris in Didot's *Bibliotheca Græca*. The funeral oration has been edited by Cobet (Leyden, 1858).

HYPERTROPHY (Gr. *ὑπερ*, over, and *τροφή*, nourishment), an excess of growth of a part without degeneration or alteration in the structure; the exact opposite to atrophy. Hypertrophy may depend on the excess of the materials of certain tissues in the blood; when this fluid contains habitually too much fat, there may be an abnormal increase of the adipose tissue; when one kidney cannot perform its functions, the other increases in size on account of the accumulation of its special materials in the blood; similar hypertrophy may thus be induced in other tissues, but there is no evidence that the muscles or nerves increase in bulk from the mere excess of their formative materials. Though an increased supply of blood is generally rather the consequence than the cause of excessive nutrition in a part, hypertrophy may arise from a mere increased circulation; this must be distinguished from the augmented bulk of long congested parts, in which there is not normal hypertrophy, but an addition of altered and inferior tissue. Hypertrophy is in most cases dependent on a preternatural formative capacity in the part, sometimes congenital (as in the abnormal growths of fingers and toes, and even entire limbs), but generally acquired. The most striking instances of acquired nutritive activity are seen in the nervous and muscular systems, consequent upon the excessive exercise of their functional powers. Excessive use of the brain in young persons of precocious intellect increases its growth beyond the capacity of the cranium, and from the consequent pressure upon the vessels may arise inactivity, imbecility, and even coma. Muscular hypertrophy is most often seen in the involuntary muscles, whose action is in some way impeded; thus stricture of the urethra or stone in the bladder, obstructing the exit of the urine and calling for extra exertion to expel it, causes hypertrophy of the muscular coat of the bladder; so it happens with the gall bladder when its ducts are stopped by calculi, and with the intestines when a stricture exists in any portion. Hypertrophy of the ventricles of the heart

is almost always dependent on pulmonary stagnation and obstruction, or narrowing of the cardiac orifices by disease of the valves, giving the organ double work to do, and increasing its activity, as in other muscles. (See **HEART, DISEASES OF THE**.) When any of the voluntary muscles are specially exercised, hypertrophy is observed in them, as in the arm of the blacksmith or the legs of a professional dancer; and such hypertrophied muscles generally cause an increased nutrition of the bones to which they are attached, and an enlargement of the points of origin and insertion. There are certain enlargements of glands, in which their proper tissue is increased without structural change, which unite physiological hypertrophy with pathological tumors, as in the case of the mammary, thyroid, and prostate glands. Certain tumors of the uterus contain only an excess of the normal muscular and fibrous tissues of the organ, and yet cannot be regarded as examples of hypertrophy, as they observe no regular growth, subserve no physiological purpose, and constitute a positive deformity and disease; such abnormal growths may exist upon a uterus itself hypertrophied from increased functional activity, and must not be confounded with the latter. Supernumerary parts, as additional fingers and toes and various outgrowths developed during fetal life, must in like manner be referred to local hypertrophy from excess of formative activity. Dr. Carpenter sees in this whole series of abnormal productions the operation of a similar power; that which in simple hypertrophy is confined to increasing the size of an organ by the development of new tissue according to the morphological type of the part, in the formation of supernumerary tissues also imparts to them an independent existence; on the other hand, while in ordinary hypertrophy the tissues in excess are incorporated into the affected organ, in the structure of a tumor the perfectly formed and independently growing tissues constitute a mass whose shape is determined more by surrounding conditions than by any tendency of their own—the formative power undirected by the normal morphological *nîsus*. In malignant growths, the development of tissue stops short of the limit by which formative power produces the normal tissues of the body, and their vital endowments are not sufficient to resist the tendency to degeneration.

HYPOCHONDRIA (Gr. *ὑπο*, under, and *χονδρος*, cartilage), a disease generally classed among neuroses, characterized by derangement of various organic functions, and accompanied by an habitual sadness, often bordering on despair, and a disposition to exaggerate every trifling symptom into a sign of dangerous malady. It constitutes the "spleen" of the English, and is in common language abbreviated into "hypo." It occurs principally in persons of melancholic temperament, and in those whose moral and intellectual faculties have received high and unnatural development; it is said to be common in proportion to the elevation of the human

mind and to the progress of civilization; it is never seen in barbarous and uncultivated nations, and is rare among the working classes. Men of letters, overtasked students and men of business, and those whose naturally delicate constitutions and ardent imaginative minds have been abnormally stimulated, are the most frequent subjects of hypochondria; but it may arise at any age and in the strongest persons after profound grief or other moral emotion, whether of love, hope, jealousy, or fear, debilitating excesses of any kind, the suppression of any habitual discharge, a sudden change of habits of life, or unceasing devotion to any philanthropic, political, or intellectual pursuit. The symptoms are as various as its causes and the constitutions of men; there is not a part of the body which may not be the subject of the hypochondriac's complaint; the senses are ordinarily very acute, and the sight, hearing, smell, taste, and touch are preternaturally excitable, and the sources of great real or imaginary suffering from the slightest causes; there is almost always digestive disturbance, which enters largely into the explanation of the causes; without fever or local lesion, the sensibility is exalted, with flatulence, nausea, spasms, palpitations, illusions of the senses, aches and pains simulating most diseases, fear of trifling dangers, exaggeration of all the moral sentiments, extreme instability of conduct, and anxiety in regard to the health. The head is full of painful sensations, as fugitive as passing clouds, agonizing at one moment and forgotten the next; sleep is disturbed and unrefreshing, and the waking hours rendered miserable by imaginary troubles. Expressing complete disgust with life, the sufferers yet run to the physician with an account of every fugitive pain, and consider themselves neglected if not listened to, and insulted if their ailments be called imaginary. Both sexes suffer from hypochondria, and the female specially in the reproductive system. Though in the beginning the disorder may have been wholly in the digestive organs, and that only of a functional and curable character, by constant and morbid attention to these and other fancied ailments real and organic disease may be produced, and a return to health be impossible. It is generally slow in coming on and of long duration, and is not incompatible with long life; if the digestion be tolerably good, the prognosis is favorable, as such persons are apt to observe most rigidly the ordinary rules of hygiene; in some impressionable but resolute natures, it degenerates into a settled melancholy, which a slight cause may convert into temporary insanity and suicidal mania. It cannot be said to have any special organic lesions, though in severe and fatal cases there have been found various alterations of the digestive, circulating, and nervous systems. There are two opinions as to the nature and seat of hypochondria; one is that it is an irritation of the nervous system which presides over the digestive organs, with or without gastrointestinal inflammation; and the other that it

is a cerebral neurosis, a kind of melancholy, as proved by the constancy of the cerebral symptoms and the efficacy of moral methods of treatment. Some modify the latter opinion by tracing it to a disturbance of the intellectual powers, which acts upon and impedes the functions of all the organs by concentrating the whole nervous energy in turn upon each system, organic lesions following upon the neurosis and displaying the morbid symptoms peculiar to each. As a general rule the disease is of far less moment than the formidable array of symptoms, the complaints of the patient, and the expression of suffering would indicate; sometimes deceitful, and their feelings misinterpreted both by themselves and the physician, irritable, suspicious, and versatile, hypochondriacs are exceedingly troublesome and unsatisfactory patients. Children of hypochondriac parents, if they show any signs of uncommon nervous susceptibility, should be educated in a manner calculated to diminish the preponderance of the nervous element, and to increase the physical strength, as by avoiding excess of study and all excitement, cultivating the generous sentiments, and by gymnastic exercises; in this way the ranks of hypochondriacs would be much lessened. Attention to the causes, when these can be ascertained, and their removal as far as possible, the observance of hygienic rules adapted to circumstances and constitutions, avoidance of excess in eating and drinking, and perhaps an occasional laxative or a tonic course, are perhaps all that can be done in the way of treatment. But in order to be of any benefit to his patient, the physician must secure his confidence, and accustom him to the belief that his affection is understood, his feelings appreciated, his sufferings commiserated, and his complaints attentively listened to; having inspired this confidence, it is not difficult to lead even the most confirmed hypochondriac to change his stereotyped way of regarding men and things, to interest him in new enterprises and modes of thought, and by judicious management to put him in the way of a return to health by following the dictates of his own feelings and common sense. Persons of strong nerves and in robust health are apt to laugh at the poor hypochondriac and to make light of his supposed imaginary pains; but this is not only unjust and aggravating, but displays an ignorance of the mental and physical constitution of man, and an insensibility to real and often acute suffering.

HYPOSULPHATES AND HYPOSULPHITES, compounds, the one of hyposulphuric, and the other of hyposulphurous acid, with bases. Of these salts the only one of much interest is the hyposulphite of soda, which possesses the property of readily dissolving the chloride, bromide, and iodide of silver. It has been of great service in the preparation of daguerreotypes and photographs, being used to dissolve the sensitive salt of silver which remains unchanged after its exposure in the dark chamber of the camera. In chemical analysis also it is employed to distinguish between the earths strontia and baryta,

precipitating the latter from its solutions, but not the former. It has moreover been adopted as a medicine, and been found beneficial in cutaneous affections, visceral obstructions, and in disease of the stomach attended with yeasty vomiting. The salt is prepared as follows. A pound of dry carbonate of soda, finely pulverized, is mixed with 5 ounces of flowers of sulphur, and the mixture is slowly heated until the sulphur melts. By constant stirring exposed to the air the sulphuret of sodium, which first forms, is converted into sulphite of soda. This is dissolved in water and filtered. The hot solution, concentrated by boiling, is then saturated with sulphur, and allowed to cool, when it deposits large transparent crystals, which are the hyposulphite of soda, of composition represented by the formula $\text{NaO}, \text{S}_2\text{O}_3 + 5\text{H}_2\text{O}$. These are soluble in water, but not in alcohol. By carefully heating, the whole of the water may be driven off without decomposing the salt, but more heat than is required for this converts it into a sulphate and sulphuret.

HYPOTHECATION (Gr. *ὑπο*, in or under, and *θηκη*, a chest), a word which in the Roman civil law, from which it is taken, signifies more nearly what we understand by mortgage than by pledge, for which they had a separate word, *pignus*; but it is not precisely the same as either. It was generally used whenever the title to property was transferred by the owner to his creditor, by way of security for the debt, but without that delivery of actual possession which was necessary to constitute a pledge. In English and American law, the word is most frequently used in the law of shipping.

HYRAX, a small pachyderm, coming nearest to the rhinoceros family, but looking much like a diminutive hare, and in some respects seeming to form one of the connecting links with the rodents, constituting the family *lamnungia* of Illiger. The old naturalists had always placed it among the rodents, but Cuvier from its anatomical structure ranked it with the pachyderms, of which Mr. Swainson calls it the glireform type. The number of ribs is 21 pairs, greater by 6 than in any rodent, of which 7 are true; the sternum consists of 6 pieces; there are no clavicles; the suborbital foramen is small; the dental formula is: incisors $\frac{2}{2}$; canines none; molars $\frac{4}{4}$ or $\frac{2}{2}$, with distinct roots; the extinct pachyderm *toxodon* has long and curved molars, without roots, and incisors with arched sockets, forming another link in the chain of rodent affinities in this order. The toes are 4 before and 3 behind, as in the tapir; the hoofs are small and flat, but the inner toe of the hind foot has a curved claw. The genus *hyrax* (Hermann) is the only one in the family, and contains 4 or 5 species. The body is covered with short, thick fur, with a few long bristles scattered among the shorter hair, and others around the nostrils and orbits; a tubercle in the place of the tail. The common name of the species is daman; it seems to bear the same relation to the rhinoceros as the existing sloths to the ex-

tinct megatherium; it lives among rocks, and is sometimes called rock rabbit and Cape badger. The Syrian hyrax (*H. Syriacus*, Schreb.) is about 11 inches long and 10 inches high; the upper parts are brownish gray, the sides yellowish, and the lower parts white. Its movements are quick, and its habits much like those of rodents; it delights in heat, in cold weather rolling itself up; it searches for narrow openings in which to hide itself, as its soft feet are not adapted for digging burrows like many rodents; its sense of smell is acute, and by it the food, which is wholly vegetable, is obtained; it is of mild disposition, with little intelligence and little fear. It is found in Syria on the mountains near the Red sea, and in Ethiopia and Abyssinia in caverns in the rocks, dozens being seen at a time warming themselves in the sun. This animal, the *asbkoko* of Bruce, according to him is called in Arabia and Syria Israel's sheep, and is the *shafan* of the Hebrews, generally translated rabbit or cony. The Cape hyrax (*H. Capensis*, Pall.) is about the size of the rabbit, but with shorter legs, more clumsy form, thick head, and obtuse muzzle; the color is uniform grayish brown, darkest along the back; it lives in the rocky regions of the south of Africa; its flesh is delicate and savory. Other species are described in the woods of Africa.

HYRCANIA, an ancient province of Asia, bounded N. by the Caspian sea, E. by the river Oxus, S. by the Sariphan mountains, and W. by Mt. Coronus and the river Charindas. The plain portion of Hyrcania was fertile, while its mountains swarmed with bees. Xenophon says the inhabitants were subdued by the Assyrians. A considerable body of them served in the army of the last Darius. They were nomads like the surrounding tribes, growing no corn, and having no fixed habitations. The modern province of Mazanderan includes a considerable portion of Hyrcania.

HYRCANUS, JOANNES, a Jewish high priest, died in 106 B. C. He was the son of Simon Maccabæus, whom he succeeded in the high priesthood as one of the Asmonean rulers of Judæa, 135 B. C. In the 1st year of his reign Antiochus Sidetes besieged Jerusalem, and obliged the inhabitants to dismantle its fortifications and pay a tribute; but after the defeat and death of Antiochus in 130, Hyrcanus reestablished his independence and extended his dominion. He razed the city of Samaria, took several other cities from the Syrian kingdom, and not only conquered the Idumæans, but compelled them to submit to the Mosaic ritual. He also formed an alliance with the Romans. In the latter part of his reign he abandoned the sect of the Pharisees for that of the Sadducees. He was succeeded by his son Aristobulus, who took the title of king of Judæa.—**HYRCANUS II.**, high priest and king of Judæa, born about 109, beheaded in 29 B. C. He was the eldest son of Alexander Jannæus and his wife Alexandra. On his mother's death (71) he succeeded to the

kingdom, but the power was soon wrested from him by his brother Aristobulus. When Pompey made himself master of Jerusalem in 63, he reinstated Hyrcanus in the government as a tributary prince. Dissensions again deprived him of power, but when Cæsar reconstructed the state he was once more restored as high priest, Antipater having the temporal authority as procurator. Herod, the younger son of Antipater, succeeded his father as procurator, and betrothed himself to Mariamne, the granddaughter of Hyrcanus. In a new attack by Antigonus, the only surviving son of Aristobulus, who was aided by the Parthians, Hyrcanus was taken prisoner; his ears were cut off to render him incapable of holding the office of high priest, and he was banished to Babylon, where the Parthian monarch and oriental Jews treated him with distinction. After some years he returned to Jerusalem, where Herod had now established himself in the sovereignty, and had married Mariamne. Becoming jealous of his claims to the throne, Herod caused him to be put to death.

HYRTL, JOSEPH, an Austrian physician, born in Eisenstadt, Hungary, in 1811. He studied at the university of Vienna, and became professor of anatomy in Prague in 1837. Since 1845 he has officiated in the same capacity in Vienna. He is distinguished for his labors in comparative anatomy, his investigations on the organ of hearing, and the invention of various anatomical instruments. His *Lehrbuch der Anatomie des Menschen* passed through 4 editions from 1847 to 1855, was translated into 5 different languages, and is now one of the standard works in all German universities.

HYSSOP (*hyssopus officinalis*, Linn.), a perennial aromatic plant, of the natural order *labiata*, a native of Europe, and cultivated there and in the United States in gardens. Its flowers, violet-colored or blue, and its leaves, are used in medicine, though but little by regular practitioners. It is a warm and gentle stimulant, promotes expectoration of the mucus, and is used in chronic catarrhs, especially by old people. The hyssop of Scripture is supposed by Dr. Royle, after investigating the opinions of various writers, to be the caper tree, *capparis spinosa* (Linn.), a tree that abounds in the south of Europe, in lower Egypt, and in Syria.

HYSTERIA (Gr. *ὑστέρα*, the womb), a disease characterized by great excitability of the nervous system, especially of the sensory ganglia, without necessary structural lesion, and manifested by disordered states of the emotional nature, with loss of the power of controlling the thoughts and feelings, by spasmodic symptoms, and occasionally by perversion or suspension of the intellectual faculties. It derived its name from the idea that it is peculiar to the female sex, originating in some disturbance of the uterine functions; but, though by far the most common in females, and generally connected with disorder in the generative system, it may also occur in males; a common name for it is "the vapors." The nervous

symptoms predominate, varying in character and intensity according to the temperament of the individual, the nature of the causes, and the persistence of the disease; in the beginning it generally manifests itself by an exaggeration of the ordinary signs of emotional excitement, such as smiles and tears, irrepressible laughter and convulsive sobs, brought on by trifling causes; the nervous excitability increases, until violent convulsions of an epileptic or tetanic character arise from slight stimuli, with coma, opisthotonos, trismus, paralysis, cramps, ending often in monomania or moral insanity. The paroxysms are sometimes of frightful intensity, requiring the strength of several persons to restrain a delicate female and prevent self-injury; after an attack the patient may be exhausted and almost insensible, and in a state of double consciousness, or much agitated, laughing or crying at the strangest fancies; at times the person falls insensible, breathing at long intervals, recovering with a sense of fatigue and coldness, or with involuntary emission of limpid urine. In cases where the nervous symptoms are less prominent, there are pain and a sense of heat and fulness in the region of the uterus, constriction of the throat with difficulty and increased desire of swallowing, a feeling as if a ball were rolling from the abdomen up to the epigastrium and throat with a sensation of pressure and suffocation, flatulence and tympanitic distention, hurried respiration, palpitations, occasional cramps, and great depression or exaltation of spirits. An attack of hysteria usually, lasts several hours, the violent symptoms recurring every few minutes, with intervals of partial rest; after the paroxysm has ceased, tolerable health may be enjoyed for some time, though the nervous excitability persists; in cases of long duration, the intellect and memory become enfeebled, the strength fails, and hypochondria and various chronic irritations of the vital organs supervene. Hysteria is very irregular in its march; it is the most Protean of diseases, simulating almost every morbid condition; its duration is variable, sometimes terminating in health after a few attacks without medical treatment, and at others lasting a lifetime in spite of the best directed efforts to arrest it; its most dangerous consequences are convulsions, spasmodic contractions, partial paralysis, epilepsy, and tendency to insanity. The predisposing causes of hysteria are the female sex and a hereditary or acquired nervous irritability; the exciting causes are vivid moral emotions, anything which excites the imagination especially, disappointed love, jealousy, and various excesses of body or mind; it is often brought on by the mere force of imitation; some irregular action of the sexual functions is found in almost all, if not in all cases between the ages of 15 and 50. There has been great diversity of opinion on the nature and seat of the disease; it has been located in the uterus, in the brain, in the spinal cord, and in the stomach and other abdominal organs. What-

ever be its origin, a disordered state of the emotional nature is an essential character of hysteria, and the control of the feelings rather than of muscular action is lessened or lost; it is partly a disease of the mind, from improper education or self-abandonment to the power of the emotions. The habitual indulgence of feelings; of a painful character or of sexual tendency affects the nutrition of the nervous and genital systems, giving rise to the peculiar phenomena of this affection. Though hysteria may simulate the phenomena of epilepsy, tetanus, chorea, hydrophobia, and other nervous diseases presented to its imitative disposition, it is dependent on a state of much less abnormal character; there is generally no structural lesion, nor any serious disturbance of the nutritive functions, as is evident from the long duration of the disease, and the suddenness with which different forms pass into each other or disappear entirely; the strangeness of these combinations and sudden changes is sufficient to distinguish hysteria from the more grave diseases which it imitates. According to Carpenter, this excitability of the nervous system, which is only an exaggeration of that characteristic of the female sex, is caused by some defect of nutrition, the particular phenomena arising either from some morbid condition of the blood acting upon the nervous centre most susceptible to its influence, or from irritation of the peripheral nerves;

he believes a gouty diathesis is one of the most frequent sources of this imperfect nutrition.—The principles of treatment are threefold: 1, to improve the nutrition of the nervous system by bringing the blood up to its healthy standard by strengthening diet, hygienic means, and the judicious employment of tonics; 2, to remove all irregularities in the menstrual or other functions, when they are evident exciting causes; 3, to act upon the mind, by leading the patient to repress the first emotional excitement by the force of the will, and to direct the attention to a different class of objects, substituting a pleasant for a disagreeable train of thought. The attack itself requires that the patient should be kept from injuring herself, and the removal of all constricting garments, fresh air, sprinkling with cold water, inspiration of ammonia or other strong or disagreeable odors, irritating the nostrils by a feather, and other similar domestic remedies. To prevent a return, tranquillity of mind and habits of self-control are the best remedies; any disappointment, whether in love, business, or other affairs of life, should if possible be removed by the realization of the hopes; if marriage be unadvisable, the tendency to hysteric attacks will often be removed by the change of air, scene, and habits resulting from a distant journey; and a similar course is useful to distract the attention from other consuming cares and passions.

I

I the 9th letter of the Latin and of most other 10th European alphabets, is derived from the 10th Phœnician, Hebrew, &c., where it is named *Jod* (hand), and considered as a consonant. As such it is the 18th *Jaman* (right hand) in the Ethiopian syllabary; being attached, when a vowel, by a diacritic mark, to each consonant. A dot under other consonants denotes its vocality in the Hebrew; other marks betoken the same in other Semitic languages. It is the 11th letter in Armenian, the 28th and last in Arabic, and the 32d and last in Persian and Turkish. The Greek *iota* is the 9th letter, but 10th numeral sign, and is sometimes subscribed to 3 vowels, thus, *α η ω*. There are many ways of representing the sound of this letter in the Devanagari, viz.: two letters when vocal, one when consonant, two diacritic lines when attached to other consonants, &c.; also letters and diacritic marks of this sound when modified by *r* and *l* in the peculiar vowels *ri*, *lri*. In hieroglyphic inscriptions it was represented by two strokes. The dot which we place over our *i* dates from the 14th century; in French the proverb *mettre les points sur les i* is expressive of trifling precision. The sound of this letter is the highest in the vocal scale, the counterpart of that of *u*. This sound (not as pronounced in *mine*, but as in *pique* or *pin*) is symbolic,

in many words of all languages, of what is little, thin, slim, swift, shrill, light, flitting; this property is mentioned by Plato. It is uttered through a broad but very thin interstice, which the tongue leaves between itself and the hard palate, by being closely raised toward it and pressed against the molar teeth; while the larynx is raised higher than in the formation of any other vocal. Hence it is considered as a palatal by John Wallis, and as a dental by C. Amman. As interchanging with the gutturals (as in the French *lait* from *lact-e*), it is virtually a guttural vowel. In the Altai-Uralic languages *i* is the neutral of their vocal harmony, between the heavy *a*, *o*, *u*, and the light *e*, *ē*, *ū*. (See FINNISH and HUNGARIAN LANGUAGES.) The Copts pronounce their *I* and *I* alike, the former long, the latter short. Modern Greeks pronounce *η*, *ει*, *οι*, *υ*, and *υι* like *i*; whereas the ancients made *αι*, *ει*, *οι*, and *υι* diphthongal, giving to the *υ* a sound like that of the German *ū*, and to the *η* that of German *ā*.—The Romans used *I* both as a vowel and as a consonant; since they, as well as the Egyptians, Hebrews, and Greeks, knew no such sounds as the French and English give to their *J* (*zh* and *dzh*). They pronounced *Ianus*, *īecur*, *proīcio*, *īus*, *īocus*, &c., as if they had been written *Yanus*, *yecur*, *proyikio*, &c. Their *maior* (greater),

ais or *ais* (thou sayest), &c., sounded as if written *mayor* and *ayis*; out of the last named word we have formed our two affirmative adverbs *aye* and *yes*, by splitting it in twain. *Iehovah*, *Iudaa*, *Iacob*, &c., uttered as now written with the modern J, are anachronisms. —The Italian language is much impaired in its beauty by the frequency of I in its grammatic formations; its J is either a consonant I or a long vowel representative of double I; thus in *jeri*, yesterday; *ajuto*, help; *consorzj*, plural for *consorzii*. In Spanish the sound of I is represented by Y; for instance, in *yerba*, herb; *Yriarte*, &c. In French there are spurious diphthongs formed with I: *j'ai*, I have; *faire*, *peine*, &c., with a nasal twang in *gain*, *sein*, &c. In the genuine diphthong *oi* in *roi*, *moi*, &c., both vowels are changed in sound, thus, *roûa* or *roûâ*, *moûa*. I is nasal in syllables ending with *n* or *m*, as *la fin*, *impétueux*, &c. As a consonant the sound of I is written with *y*, equivalent to double *i*, as in *payer*, *noyer*, *essuyer*, &c. The Germans use J as a consonant, as in *Jude*, *ja* (pronounced *yoodê*, *ya*); and they now employ I as part of the old diphthong *ey*, thus: *bei*, *sei*, &c., formerly written *bey*, *sey*. In English, the Italian sound of I, that heard in *marine*, is written in 14 ways (both short and long). Words ending originally in *age* (collection) are now written in *idge*, as *porridge*, &c. The diphthong in *mine* (Germ. *mein*) is taken for the long sound of I, and its genuine long sound is transferred to E, as in *mete*. The consonant I is written with Y in English, thus: *yes*, German *ja*; *yacht*, *yellow*, &c. The English dictionaries and the French "Encyclopædia" of the 18th century, those of Ersch and Gruber, of Pierer, &c., and many other lexicons, class words in I and J together; but this is logical only when both represent the same sound, and not when the latter is the sign of a hissing simple or compound sound. In Russian, *ie*, *iv*, *ia*, *ien*, are written with peculiar letters. In Polish the I often adheres to E, as in *siebie* (Latin *sibi*), &c. —I often interchanges with *e* in the Semitic languages; thus: Heb. *iâlâd*, Arab. and Ethiop. *râlâdê*, to produce, beget; *iâtsâ*, Arab. *râsâ*, bed; *iâqah*, Arab. *vaggy*, to revere, &c. With other vowels or diphthongs: Germ. *seite*, Lat. *situs*; *sei*, *sit*; *treiben*, *τρεῖν*; *adipiscor*, from *ad-apiscor*; *transigo*, *deficio*, &c., from *ago*, *facio*; *similis* and *simul*, *simultas*; *facilis* and *facultas*; *familia*, from *famulus*; *olli*, *ollus*, and *illi*, *ille*; *illico*, *cognitus*, from *in loco*, *cognosco*, &c.; often in reduplications, as *gigno*, *sisto*, *μῦνω*, *πῖνω*, &c., from the roots, *gen*, *sto*, *men*, *pet*. Ital. *freddo*, *verde*, *regno*, *betere*, *fede*, &c., from Lat. *frigidus*, *viridis*, *signum*, *bibere*, *fide*; Span. *concebo*, *hebra*, &c., Lat. *concipio*, *fibra*; Eng. *enclose*, *enquire*, &c., and *inclose*, *inquire*. Ancient Latin, *maxumus*, *optumus*, &c., for *maximus*, *optimus*; the accusative and ablative *em*, *e*, and *im*, *i*. Iran, from *Aryan*; *Ebro*, *negro*, from *Iberus*, *niger*; Fr. *crête*, *crêpu*, &c., from *crista*, *crispus*. It is sometimes substituted for *c*, *g*, as in

Fr. *fait*, fact, Portug. *feito*; *roi*, *loi* (Lat. *rex*, *lex*), *loyal* (*legalis*), &c. —In abbreviations, I stands for *invictus in*, *inferi*, *Iulius*, *Iunius*, &c.; I. C. for *iuris consultus*, &c. During the lethargy of literature I was used to denote 100. Among the Romans it denoted 1; when placed after other numerals it was to be added; when placed before, to be subtracted; thus: VI = 6; IX = 9; though sometimes it was a factor in the latter case, thus: IIC = 2 × 100 = 200. On French coins it denotes Limoges as the place of coinage. —In music, I is the name of the 9th tie on the neck of the lute, and of various old musical instruments. Kirnberger, Fasch, and other organists, denoted by it a by-tone between *a* sharp and *b* flat.

IAMBlichus, a Neo-Platonic philosopher, born in Chalcis, Cœle-Syria, flourished in the first half of the 4th century A. D. He was a pupil of Anatolius and Porphyry, and after the death of the latter became the head of the school in Syria, and was so much admired by his pupils and contemporaries that they styled him the "most divine teacher," and declared him the equal even of Plato. Little is known of his life, except that he made an excursion annually to the hot springs of Gadara, and that miraculous acts were ascribed to him, which, whether invented by his admiring disciples or pretended to by himself, reveal the tendency of the Neo-Platonic school at this time to combine the thaumaturgus with the philosopher. He had thoroughly studied the systems of Plato and Pythagoras, and the theology and philosophy of the Chaldeans and Egyptians, and his speculations, even more than those of Plotinus and Porphyry, present a confusion of Hellenic and oriental ideas. Of his numerous writings there remain only 5 books of his work on the doctrines of Pythagoras, a treatise on the Egyptian mysteries, the authorship of which has been doubted, and several fragments. Unlike his predecessors Porphyry and Plotinus, he did not regard the perception of the Deity by means of ecstasy as the object of philosophy, but maintained a direct union with God by means of theurgy or the supernatural science, to which he made philosophy subordinate. Theurgic rites and ceremonies, and certain mysterious symbols, though perfectly understood by God alone, have power to influence the divinities according to human wishes. His mysticism and extravagances appear most strikingly in the work on Egyptian mysteries. Though the most fantastic of the Neo-Platonists in his theological tenets, he surpassed his immediate predecessors in the simplicity of his ethical doctrine, reproducing with fewer modifications the ideas of Plato. The extant books of his work on the Pythagorean philosophy have been published under different titles; the last edition of the 1st (which contains the life of Pythagoras) and 2d is by Kiessling (Leipsic, 1813–15), of the 3d by Fries (Copenhagen, 1790), of the 4th by Tennulius, &c. (Arnheim, 1668), and of the 7th by Ast (Leipsic, 1817). His work on Egyptian mys-

teries was published by Thomas Gale (Oxford, 1678). It was translated into English by Taylor the Platonist (Chiswick, 1821), who also translated the "Life of Pythagoras" (London, 1818).

IAMBUS, in prosody, a foot consisting of two syllables, the first short and the second long. The union of 6 of them constitutes an iambic verse, called by Aristotle the most colloquial of metres, and employed by the Greeks chiefly in satirical and dramatic poetry. It admitted of the substitution of a tribrach for either of the first 5 feet, of a spondee for the 1st, 3d, or 5th, of a dactyl for the 1st and 3d, and of an anapest for the 1st. The Italian *verso cadente* and the English heroic verse consist of 5 iambs.

IBARRA, JOAQUIN, a Spanish printer, born in Saragossa in 1726, died in Madrid, Nov. 23, 1785. He contributed powerfully by his inventions and improvements to the promotion of the art of printing in Spain, and from his press issued splendid editions of the Bible, of Mariana's history of Spain, of "Don Quixote," of the infant Don Gabriel's translation of Sallust, &c., which are still sought for by bibliopoles.

IBERIA, the ancient Greek name of Spain. The aboriginal Iberi, from whom the name was derived, seem to have occupied the entire southern portion of the peninsula from the strait of Gibraltar to the Pyrénées, until the date of the Carthaginian invasion. Mr. Ticknor in his "History of Spanish Literature" says: "The Iberians are the oldest of the occupants of the Spanish soil, and the people who, since we can go back no further, must be by us regarded as the original inhabitants of the peninsula. They appear, at the remotest period of which tradition affords us any notice, to have been spread over the whole territory, and to have given to its mountains, rivers, and cities most of the names they still bear—a fierce race, whose power has never been entirely broken by any of the long line of invaders who at different times have occupied the rest of the country." The Iberians maintained a lively commercial intercourse with the Carthaginians, and they displayed much artistic skill in the use of the precious metals, and great activity in mining. Boudard, who published in 1851 a work on the Iberian alphabet, has since prepared an important work on the Iberian coins (*Numismatique Ibérienne*, Paris, 1857 *et seq.*).—The Greeks and Romans also called by the name of Iberia the country of the Caucasus now known as Georgia. This country was bounded by the Caucasus, Albania, Armenia, and Colchis. These Asiatic Iberians were divided into 4 castes. The origin of their name is unknown.

IBERVILLE, a S. parish of La., bounded W. by Atchafalaya bayou and S. E. by the Mississippi; area, 450 sq. m.; pop. in 1855, 14,830, of whom 9,235 were slaves. It has a flat surface, and is frequently inundated. The lands lying near the rivers are fertile; the rest of the parish is mostly uncultivated. The productions in 1855 were 262,773 bushels of Indian corn,

914 bales of cotton, 28,686 hhds. of sugar, and 50,462 bbls. of molasses. Value of real estate in 1855, \$4,867,000. Capital, Iberville.

IBERVILLE, LEMOINE D', a Canadian navigator, who began the colonization of Louisiana, born in Montreal in 1642, died in Havana, July 9, 1706. He was one of 7 brothers who were all active in Canadian affairs in the latter half of the 17th century. He early went to sea, and distinguished himself for bravery and ability as a volunteer in the midnight attack on Schenectady, as commander of the expedition which recovered Fort Nelson from the British (1686), and with it the control of the Indian commerce of the region of Nelson's river, as a successful invader of the English possessions in Newfoundland, and as a victor in naval contests (1697), in spite of icebergs and a shipwreck, in Hudson's bay. He was reputed the most skilful naval officer in the service of France, when in 1698 he was commissioned by the French government to explore the mouth of the Mississippi, which had never yet been entered from the sea, and to erect a fort near it. With two frigates, two smaller vessels, a company of marines, and about 200 settlers, he set sail from Rochefort, Oct. 17, 1698, was welcomed at St. Domingo, found Pensacola preoccupied by Spaniards, and cast anchor, Feb. 2, 1699, on the island of Massacre near Mobile. Accompanied by his brother, Lemoine de Bienville, a Franciscan who had been a companion of La Salle, and 48 men, in two barges, and with provisions for 15 days, he sailed thence to seek the Mississippi, which they entered March 2, and ascended to the village of the Bayagoulas. They also visited the Onzas, among whom they found a letter written by Tonty to La Salle in 1684, and they probably reached the mouth of the Red river. Returning to the bay of Biloxi, Iberville erected a fort as a testimony of French jurisdiction, the command of which he intrusted to his two brothers Sauvolle and Bienville. He himself sailed for France, but returned when the French supremacy upon the Mississippi was endangered by British aggression, and the French Protestant refugees were seeking there an asylum after their exile from France. He again ascended the Mississippi (1700) as far as the country of the Natchez, while his brother explored western Louisiana, crossed the Red river, and approached New Mexico. Bilius fevers desolated the colonists at Biloxi; Sanville was a victim to it, and the chief command devolved on Bienville; and when Iberville arrived with reinforcements (July 22, 1701), there were but 150 of them alive. Soon after this fortress was transferred to the western bank of the Mobile river, the first European settlement in Alabama. Iberville also constructed fortifications on the island of Massacre, which he named Dauphine island, and which became the centre of the colony. Attacked by the yellow fever, he escaped with broken health. In 1706, in command of 3 vessels, he made a descent upon the English island of Nevis, which he captured; and he

died at Havana on board of his ship on the eve of an expedition against Jamaica.

IBEX, a species of wild goat, inhabiting the mountainous regions of Switzerland, the Pyrénées, the Caucasus, and Abyssinia. The generic characters are given in the article GOAT. The common ibex (*capra ibex*, Linn.), the *bouquetin* of the Swiss hunters, is about 5 feet long, and $2\frac{2}{3}$ feet high at the shoulders; the horns are large, flat, with 2 longitudinal ridges at the sides and numerous transverse knobs; at first nearly vertical, they curve backward and outward to a length of about 30 inches; they are dark colored and very stout. The color of the adult is brownish, with a grayish tint in winter and reddish in summer; the hair is short and thick; the under parts are whitish, and the dorsal stripe blackish brown. The period of gestation is about 160 days, and the young are usually born in April. They prefer the highest and most inaccessible mountains, near the line of perpetual snow, and are accordingly hunted with great difficulty and danger. The Abyssinian ibex (*C. jaela*, H. Smith), known to the Greek and Hebrew writers, is rather higher than the preceding species, with longer horns, more circular and less divergent, rounded in front and marked with numerous transverse ridges; the color of the hair is brownish fawn, with a dark dorsal line; under the throat and neck the hair is lengthened. The Caucasian ibex (*C. caucasica*, Guld.) is broader and shorter than the European species; the horns are triangular with distant ridges, very solid, dark brown, and about 28 inches long. The color is dark brown above, head grayish, breast and dorsal line blackish, and throat whitish gray; the hair is coarse, having at the roots a grayish wool. All these animals are remarkable for strength and agility, making immense bounds among the most dangerous precipices; they are said to fall from considerable heights upon the horns, when pressed by the hunter, and apparently receive no injury from the shock. They are all probably more or less mixed with the common wild goat (*C. agagrus*) of Europe, and have contributed largely to the production of the numerous varieties of the domestic goat. (See GOAT.)

IBIS, a wading bird of the family *tantalidæ*, including the genera *ibis* (Moehr.) and *geronticus* (Wagl.); the genus *tantalus* (Linn.) will be noticed under WOOD IBIS. The genus *ibis* is characterized by a lengthened, slender bill, curved for its whole length, with the sides compressed and tip obtuse; the nostrils are in a groove which extends to the tip of the upper mandible; forehead and base of bill, to behind the eyes and on the chin, in most species bare; wings long and pointed, with the 1st and 2d quills equal and longest; tail rather short and nearly even; tibia bare for half its length, covered with hexagonal scales; tarsi slender, longer than the middle toe, with broad transverse scales in front; toes long and slender, the lateral ones united to the middle by a small web; hind toe long and slender, claws curved and

rather weak. There are about half a dozen species, of which 3 are found in the United States. The red or scarlet ibis (*I. rubra*, Linn.) is about 28 inches long, the extent of wings a little over 3 feet, and the bill $6\frac{1}{2}$ inches. The color is a uniform bright scarlet red, with the tips of the outer primaries black; in the young the color is ashy, darkest above, with the under parts and rump white. Its natural habitat is South America and the West Indies, but it has been seen in the southern states by Audubon; it is sometimes called, from the length and shape of the bill, the pink curlew. The white ibis, Spanish or white curlew (*I. alba*, Linn.), is 25 inches long, with an extent of wings of 40 inches, and the bill 7 inches. The color of the plumage is pure white, with the tips of the outer 5 primaries shining greenish black; the bill is red, entirely so in the young birds, but with the terminal half black in the adult; the head in front of the eye is bare; the young birds are of a dull brown color, with the under parts and rump white. This species is very common in the southern Atlantic and gulf states, occasionally straggling as far north as New Jersey. They breed in large companies on the Florida keys on trees; the nest is about 15 inches in diameter, formed of twigs and roots, flat on the inside; the eggs are 3, and are laid only once a year, $2\frac{1}{4}$ by $1\frac{5}{8}$ inches, dull white, with pale yellow blotches and reddish brown spots; incubation generally takes place between the 10th of April and the 10th of May; the eggs afford excellent eating, though the yolk is of a reddish orange color when boiled, and the white a livid-colored jelly. When breeding, they fly in flocks of several hundreds to the mud flats, sometimes to great distances, where they feed on crabs, crawfish, and other crustaceans, mollusks, and aquatic animals, until the tide begins to come in, whether by day or night. The flight is rapid and well sustained, effected by alternate flappings and sailings; they often rise very high in the air, performing beautiful evolutions. They are fond of resorting to ponds or lakes in the woods, and often breed in such localities more than 300 miles from the sea; though not taking naturally to the water, they can swim tolerably well when forced to it; the walk is light and graceful. The flesh has a very fishy taste, and is rarely eaten except by the Indians. The glossy ibis (*I. Ordi*, Bonap.) is a smaller species, being about 21 inches long, with a bill of $4\frac{1}{2}$ inches; the general color is chestnut brown, with the back and top of head metallic green glossed with purple; the feathers continue almost to the bill, which is of a dusky black color. It exists in great numbers in Mexico, and it has been procured as far north as Massachusetts. The green ibis (*I. falcinellus*, Linn.) is a native of southern Europe and northern Africa; it much resembles the glossy ibis, being of a purplish brown color, with a deep green mantle; in the young birds the head and neck are pointed with whitish. These ibises all live in warm climates, performing their

annual migrations, and are generally seen on lands recently inundated, and on river banks, seeking for worms, snails, crustaceans, insects, and the roots of bulbous plants, or on the sea coast as above mentioned.—The genus *geronticus* has a stronger bill, a longer and broader tail, the 3d and 4th quills the longest, tarsi and toes stouter, and the head and neck more denuded of feathers, than the preceding; in some species the scapulars are long, and consist of decomposed plumes. There are about 20 species, found in the warmer parts of Africa, Asia, and South America, of which will be mentioned here only one, the sacred ibis of the ancient Egyptians (*G. Æthiopicus*, Lath.). It is about as large as a domestic fowl; the plumage is white, with the ends of the quills, the elongated barbs of some of the wing coverts extending over the wings and tail, bill, feet, and naked part of the head and neck, black; it is found throughout northern Africa. This bird was reared in the temples of ancient Egypt with the greatest care, and was embalmed after its death; it was forbidden to kill one on pain of death. This superstitious people revered the ibis, not because they supposed that it destroyed noxious reptiles, or that there was any relation between the changes of its plumage and the phases of the moon, but because they associated its annual appearance with the period of the inundation of the Nile, the source of the fertility and healthfulness of the land; the crafty priests led the people to believe that the increase of the river, which brought the birds there in search of food, was the consequence instead of the cause of their visit; the educated class regarded the ibis as the harbinger of the fruitful epoch of their year, as we look upon the coming of the bluebird and the swallow as the signs of spring. A black ibis was also honored and embalmed. The flight of these birds is powerful and high, with the neck and feet extended horizontally, and accompanied by occasional harsh cries. They probe the mud with their bills in search of insects, worms, mollusks, &c., advancing by slow steps; they arrive in Egypt when the Nile begins to increase, and migrate about the end of June, not nesting in that country; they are caught in great numbers by the modern Egyptians in nets, and their bodies are frequently exposed for sale in the markets. Both species usually go in small flocks. All the species have the same habits, frequenting both overflowed lands and dry open plains; they sometimes devour frogs and small aquatic lizards, but do not destroy serpents as Herodotus and many writers since have maintained; when satiated with food they perch on high trees, and are very watchful; the nest is either on a decayed tree or on the ground, and the eggs are 2 or 3 in number. For full details on the sacred ibis, see Savigny's *Histoire naturelle de l'ibis* (8vo., Paris, 1805).

IBN-BATUTA. See BATUTA.

IBRAHIM PASHA, an Egyptian viceroy, the son, or according to some the adopted son,

of Mehemet Ali, born in Cavala, a village of Roumelia, in 1789, died in Cairo, Nov. 9, 1848. He possessed all his father's ability, with even more than his ferocity. His youth was passed in battles with the wild tribes of upper Egypt, wherein he acquired that pitiless disregard of life which he afterward exhibited against the Greeks. His first exploit of consequence was the reduction of the powerful Arabian sect of the Wahabees (from 1816 to 1819), which he completed by taking their capital, Derayah, and putting its inhabitants to the sword. For this service the sultan made him pasha of Mecca. In the Greek revolution Mehemet Ali sent a strong force in the beginning of 1824 to the Morea, Cyprus, and Candia, in aid of the Turks, the sultan having bestowed on him the government of those provinces on condition that he would reduce them. Ibrahim was sent as generalissimo of the Egyptian force. The Greeks were at first successful in harassing his fleet, but in 1825 he disembarked 10,000 men at Modon, and thenceforth he had command of the Morea, and carried desolation wherever he went. The Christian powers, which had at length intervened and won the great naval battle of Navarino, insisted on Ibrahim's evacuation of the Morea, which he accordingly left in 1828, and returned to Egypt. In 1832 Mehemet Ali, being determined to extort from the sultan the full and hereditary sovereignty of Egypt, made a quarrel with the pasha of Acre the pretext for invading Syria. An Egyptian army under Ibrahim captured without much trouble the towns of Gaza and Jaffa. Acre surrendered after 3 months' siege, but not until a Turkish force sent to its assistance had been dispersed. The sultan and Mehemet being now in open war, Ibrahim advanced by a succession of victories to Aleppo, which he took, and thus laid the whole of Syria at his feet. His father sent him orders to advance through Asia Minor with the view of attacking Constantinople itself; but Ibrahim, having defeated at Konieh 60,000 Turks under Reshid Pasha, awaited reinforcements before advancing, while Russian troops sent in aid of the sultan made their landing in Asia Minor. At the intervention of the European powers a peace was concluded, which gave Syria and the district of Adana to the conquerors. The war was renewed in 1839, when Ibrahim totally routed the Turkish army at Nisib. The European powers again interfered. Various efforts at arrangement having failed, the British fleet took Beyrout and St. Jean d'Acre (1840), and appeared before Alexandria, whereupon Mehemet concluded a treaty by which he consented to withdraw his army from Syria. This terminated Ibrahim's military career. He visited France, England, Spain, and other parts of Europe in 1845, for the purpose of obtaining medical aid, and was received on his tour with great consideration. In 1848, Mehemet Ali having become incapable by age of carrying on the government, Ibrahim went to Constantinople.

tinople and was invested with the authority of viceroy, but died soon after his return. His descendants were debarred from the succession, which passed to Mehemet Ali's grandson Abbas, and in 1854 to the present viceroy, Said Pasha.

IBRAILA. See BRAHILOV.

IBYCUS, a Greek lyric poet who lived in the middle of the 6th century B. C. He was a native of Rhegium in Italy, and lived at the court of Polycrates, tyrant of Samos. It is narrated that as he was travelling near Corinth, he was attacked and mortally wounded by robbers, and invoked a flock of cranes, then passing overhead, to avenge his death. The cranes, obedient to the invocation, directed their flight to Corinth, and hovered over the people as they sat in the theatre. The murderers were present, and one of them on seeing the cranes exclaimed involuntarily: "Behold the avengers of Ibycus." This led to an inquiry, and to the punishment of the assassins. The poetry of Ibycus was mostly erotic, but sometimes mythical and heroic. There are but a few fragments of his works in existence, the best edition of which is that of Schneidewin (Göttingen, 1835).

ICARUS. See DÆDALUS.

ICE, water or other fluid solidified by freezing. Various liquids become partially solid at low temperatures, but this is commonly owing to the water of which they are in part composed; and none of them produce a clear uniform solid like that of frozen water. At 32° F. under ordinary circumstances water begins to crystallize. Slender prisms, usually of 6 sides and terminated by 6-sided pyramids, form in it, and arrange themselves in lines, crossing each other at angles of 60° and 120°. The presence of salts in solution impedes this process, and when at last it takes place at a temperature below 32°, the greater portion of the foreign matters is excluded from the ice, which consequently is nearer the composition of pure water. Advantage is taken of this in some operations designed to concentrate the strength of liquors, as of vinegar, the portion that first crystallizes by cold being removed, and leaving the residue less diluted. Pure water contained in a polished vessel and kept perfectly quiet may be reduced to even 15° without freezing; but agitation or the introduction of foreign bodies will cause congelation to take place suddenly, and as the ice is formed latent heat is liberated, and the temperature rises to 32°. Saline solutions sometimes exhibit a similar reluctance to deposit their salts in crystalline form even when reduced by evaporation below their point of saturation; and in these cases crystallization is often suddenly induced by the same methods that cause the water to congeal. From about 39° water expands as its temperature is reduced; and it does this with the exertion of prodigious force in freezing. A hollow globe of brass with a cavity only an inch in diameter, filled with water, has been burst by the freezing of this, exerting a force, as estimated, of 27,720 lbs.

The effect of this property is seen in the tendency of ice to plough up the banks of ponds, to split off masses of rock from mountain cliffs, and to loosen and pulverize the soil through which it is diffused. The effect last named is not perceived till the thaws of spring, when the frost is said to come out of the ground. This force has been artificially applied to splitting rocks and trunks of trees by allowing water to freeze in their fissures. This expansion, estimated by Boyle at $\frac{1}{8}$ the original volume, gives to ice less density than that of water, so that it floats. Its specific gravity by this estimate should be 0.9; M. Brunner in his series of experiments found it to vary from 0.918 at 0° C. to 0.92025 at -20° C. But for this singular exception to the usual law of increase of density by reduction of temperature, ice as it forms would sink to the bottom, and there accumulate beyond the reach of atmospheric heat. Great collections of water would be chilled throughout, and their fitness for sustaining life in cold regions be entirely destroyed. But as the ice, a bad conductor of heat, covers the water, it serves as a protecting sheet to retain the warmth below, and preserve the water from the extreme temperature that prevails above. As the cold increases, the solid ice is found to be subject to the usual law, contracting as found by Brunner more than other solids; and upon ponds in excessively cold weather it contracts, and in shrinking parts asunder in the weakest places with loud reports. A form of ice called anchor ice is often seen in cold weather attached to objects at the bottom of streams. Its character is explained by Prof. Dewey on the supposition that the whole body of water is cooled below the freezing point, but under conditions of quietness opposed to the formation of ice. The substances at the bottom serve as points of congelation, like those introduced into saline solutions to cause crystallization to take place, and ice forms upon them. It is observed to gather in a clear cold night, when the surface of the water is not frozen, and its temperature is at the freezing point, that of the air being still lower. The layers of ice are sometimes 3 inches thick; and as soon as they are detached from the bodies which hold them down they rise to the surface. Some other properties of ice are noticed in the article GLACIER.—From the earliest times ice and snow have been esteemed as luxuries for cooling water and other liquors in the warm climates of the East. "As the cold of snow in the time of harvest, so is a faithful messenger to them that send him." (Proverbs, xxv. 13.) Its production in regions distant from those which most require it is a provision for the commerce of nations, leading to the intercourse of people living in countries far separated from each other. In modern times, from having been regarded only as a luxury, its use has extended till it has become almost one of the necessities of civilized people. Its chief value perhaps consists in its antiseptic property. Meats and fish are preserved fresh by it more

conveniently and efficiently than by any other means; and its largest consumption is in the great markets of our cities. Vessels at sea need not now as formerly depend for fresh meat upon live animals taken at great inconvenience on board; but, by means of a small ice house, they can preserve their supplies fresh for a considerable voyage. In sickness, and especially in the fever of hot climates, ice is not only a most grateful application, but is often the only means of saving life; and its introduction into India is justly esteemed a blessing by its inhabitants. The high estimation in which the natives held this material is indicated by the pains they took to produce it artificially, as explained in the notice of the operations of those living upon the plains near Hoogly, 40 m. N. of Calcutta, in the article *CORD*. By the slow and careful process that they employed they succeeded in collecting small supplies of ice, which with great pains they transported by night to Calcutta, protected from melting by being packed in baskets lined with straw mats. The ancient Greeks and Romans boiled the water they wished to freeze, the freedom from air, on the supposition of Sir John Leslie, causing it to congeal more readily. Ice produced from boiled water is, like that which makes over deep ponds, more dense and comparatively free from air bubbles.—In the article *FREEZING MIXTURES* an account is given of various methods of producing low degrees of temperature by mixing and stirring together different saline bodies. In producing ice upon a large scale the *Société d'encouragement* of Paris find that the cost of the ice made by the most convenient and cheapest method cannot be less than about $5\frac{1}{2}$ cts. a pound, the composition employed being fragments of ice and common salt, or nitrate of ammonia and water. In this estimate is included the cost of fuel required to recover the salts by evaporation. Where fuel is cheap, the cost would be considerably less.—In the article *EVAPORATION* instances are noted of extremely low degrees of temperature obtained by this method. Sir John Leslie, who originated this class of experiments, noticed that the frigorific effect of evaporation is greatly increased by rapidly removing the vapor as it forms, thus causing it to be replaced by more with further abstraction of heat from the liquid evaporated. He employed porous vessels which admitted the liquid placed in them to ooze through and evaporate on all sides. One of these being set in an outer vessel together with some good absorbent of moisture, as perfectly dry flannel, parched oatmeal, &c., or better than all strong sulphuric acid exposing a broad surface, evaporation went on rapidly with great reduction of temperature. He recommended for a cooler for domestic purposes, in the want of ice, the use of a cylindrical vessel of dense glazed earthenware, 12 to 16 inches diameter, charged with sulphuric acid covering its bottom $\frac{1}{2}$ inch deep, to be placed in a cool cellar. Upon a porcelain stand in the middle of the cistern is placed a porous earthen pot filled with water, and the

outer vessel is then to be closely covered. The effect is greater as the difference is increased between the surface of the small vessel of water and the area of sulphuric acid. In the porous vessel butter or a bottle of wine may be placed to be cooled, or the bottle may be covered with a woollen stocking soaked in water, and placed upon a shelf in the vessel and left for a few hours. Leslie effected much more striking results by the use of the air pump in addition to the sulphuric acid. As the air is exhausted from the surface of the water, this is thrown into commotion, as if boiling, in consequence of the air it contained escaping. The vapor rapidly produced is immediately absorbed by the acid, and the water thus parting with its heat becomes of lower temperature than the freezing point, when at last it congeals and rises to 32° . This result gave encouragement to attempt upon the same principle the manufacture of ice on a large scale. The process has been made more effective by placing a vessel of ether with the water and pumping out its vapor as it rapidly forms in the exhausted receiver. The ether vapor is collected and condensed to go the same round again. A combination of apparatus designed to produce this effect was patented in England in July, 1850, by Prof. A. C. Twining, then of Hudson, Ohio, and the same was patented in the United States in Nov. 1853. In this the ether partially evaporated in one vessel is made to flow in its chilled state continuously around vessels containing the water to be frozen, from which withdrawing a portion of caloric it flows back to the evaporator and is again chilled. The same power that draws off the vapor compresses it into a chamber in which it is condensed, and from which it passes in the liquid state to unite with the main supply. With this apparatus it was anticipated that ice could be manufactured to great profit, and machines were constructed to test the principle on a large scale. A similar trial is reported to have been made in London in 1858 by Mr. Harrison of Geelong, Australia, who with an engine of 10-horse power produced from 5,000 to 6,000 lbs. of ice per day. Another machine upon a different principle was invented by Dr. Gorrie, and put in operation a few years since in New Orleans. When air is compressed it parts with a portion of the heat belonging to it, and as it expands again it takes back the same amount from bodies in contact with it. Air thus deprived of heat can be made to take it from uncongealable fluids, which in this way accumulate cold that may be applied to freeze water. In the machine the air is compressed in a powerful pump attached to one end of a walking beam, and a smaller pump with the same stroke throws jets of water into the compressed air, taking up the liberated caloric. The mixed air and water pass into a large receiver, and from this the air enters another pump at the other end of the beam, aiding to raise its piston as it expands. In this pump the uncongealable saline solutions are dis-

charged in jets, yielding a part of their caloric to the expanding air. The liquid then goes back to its reservoir, and a new supply is sent from this to be chilled and returned with the next stroke. The water to be frozen is in a vessel surrounded by that which contains the working fluids. This machine was afterward patented in Great Britain; and from the account in the "London Mechanic's Magazine" it appears that with pumps of about 8 inches diameter and 16 inches stroke, condensing and expanding air to and from a tension of 3 atmospheres, a block of ice weighing nearly 60 lbs. was produced by the labor of 2 men in 2 hours.

—ICE TRADE. Ice was little known as an article of commerce until the early part of the present century. In the 17th century its use was so common in France that many dealt in it and in snow, gathering these in winter and packing them closely in pits surrounded with straw or other non-conducting substances and protected from the air. The Italian peasants also have long found a profitable business in collecting the snow upon the Apennines and storing it in the caves of these mountains to supply the large demand at Naples, where it is stated there are snow shops in almost every street, which are kept open day and night through the warm season. The bodies of ice found in the recesses of Mount Etna, and excavated sometimes from beneath beds of lava which have flowed over them, are noticed in the article ETNA. In the last century the gathering and storing of ice for summer use is known to have been practised in some of the middle states of the American Union, the receptacles for preserving it being deep cellars, placed so as to be readily drained, or from which the water was pumped out as it collected; but though most wanted in countries where it is not naturally produced, no attempts had been made to transport it by sea. This was first done by Mr. Frederic Tudor of Boston, who sailed himself with a cargo of 130 tons in his own brig to Martinique in 1805. The ice was brought down to Charlestown, Mass., from a part of Lynn then called Saugus. Mr. Tudor persevered in the business, making little or no profit, however, till after the close of the war of 1812. In 1815 he obtained the monopoly of the Havana business and important privileges from the Cuban government. In 1817 he introduced the trade into Charleston, S. C., the next year into Savannah, and in 1820 into New Orleans. Frequent disasters attended his enterprises, and in 1832 his entire shipments amounted to only 4,352 tons, the whole of which came from Fresh pond in Cambridge. In May, 1833, he sent the first cargo of ice to the East Indies, which was delivered at Calcutta in the autumn of that year. Of 180 tons, one third was wasted on the voyage, and 20 tons more in going up the Ganges. It was packed in large blocks closely fitted together between a double plank casing filled in with dry tan. The ice was sold immediately at no more than half the cost of that pre-

pared by the natives. At the present time a waste of about one half is generally expected on this voyage. In 1834 the first cargo was shipped by Mr. Tudor to Brazil. Until 1836 he conducted the whole trade; but as it became profitable others began to enter into it, and from other ports beside Boston. This, however, has the great bulk of the trade, which from Boston has increased as follows, according to the incomplete returns that have been preserved:

In 1805.....	1 cargo,	130 tons
" 1816.....	6 cargoes,	1,200 "
" 1826.....	15 "	4,000 "
" 1836.....	45 "	12,000 "
" 1846.....	175 "	65,000 "
" 1856.....	303 "	146,000 "

These figures show an extraordinary rapidity of increase, still continuing, and the establishment of an important branch of commerce upon a natural production formerly regarded as of no value. It has served to secure to Boston the chief portion of the Calcutta trade, and provides her ships with cargoes for the southern ports, thus reducing the expenses of freighting southern products to the north. Of the 146,000 tons shipped in 1856, it is estimated that 81,391 tons were for southern domestic ports. Into the interior ice has been carried by railroad in considerable quantity as far as Knoxville, Tenn. The shipments to England, which were at one time nearly 1,000 tons annually, have been greatly reduced by the supplies furnished from Norway at less rates than the cost of American ice. The superior quality of the latter, however, enables it to compete with the Norwegian article, and a Massachusetts association called the Wenham lake company erected extensive houses in London and Liverpool for storing ice, with capacity for conducting an annual business of several thousand tons. The chief difficulty in establishing the ice business in warm countries has been the necessity of constructing houses especially adapted for preserving the ice; and these to be profitable must be upon a large scale. One of these erected in 1845 at Calcutta, by Mr. Wyeth of Cambridge, covered more than three fourths of an acre, and was capable of holding 30,000 tons of ice. Its walls of brick were triple, with flues or air spaces between; their length was 198 feet by 178 feet, and their height 40 feet. The building was covered by 5 roofs, and between every two contiguous ones were air spaces.—New York city is supplied with ice chiefly from small lakes near the Hudson river, or from the river itself above the reach of tide, as at Athens, opposite Hudson, and other places. The largest quantity furnished by any one of these sources is from Rockland lake in Orange county, about 120,000 tons annually. The whole amount delivered in the city is about 285,000 tons, of which only 20,000 is for exportation. With the growth of the business upon the coast it has also spread in the interior, where, especially near the large towns, the gathering of ice is now an important business. In the interior towns it is afforded at wholesale in the summer

at \$2 50 to \$3 a ton, and in small quantities at about \$4. In Boston large supplies for shipment are commonly worth about \$2. The great lakes furnish supplies which are carried by railroad to the cities lying south, and through the Illinois river ice is sent down the Mississippi. In the autumn the ice boats come up to the vicinity of Peru, Ill., where they are allowed to be frozen in. In the winter they are filled, and in the spring when the ice breaks up they float down with their freight. The ice produced in deep ponds by the severe cold weather of New England is particularly adapted by its hardness and compactness to keep well, while the purity of the water gives it clearness and renders it especially agreeable. The ice formed upon the shallow waters of Great Britain is found to be porous and very inferior in durability to that from the United States of the same thickness. —The methods of gathering and storing ice are entirely American. When the ice is 9 inches to a foot thick, or if for exportation 20 inches thick, the snow, if there be any, is cleared off the surface with wooden scrapers, each drawn by one horse. Another scraper armed with a steel blade planes off the porous upper layer to the depth of 3 inches or more if necessary. The surface is then marked off in large squares by a sort of plough drawn by a horse, which cuts a groove about 3 inches deep. A machine somewhat like a harrow with 3 or more parallel rows of teeth, which may be 22 inches apart, is next drawn along the lines already made, one row of teeth running in the groove as a guide; and as many more cuts are made as there are more rows of teeth. This is repeated upon the cross lines, and the whole area is thus cut into small squares. If necessary, a deeper plough is afterward run through all the grooves to increase their depth. A row of blocks is then sawn out by hand, and being taken out or thrust under the others, room is made for splitting off the adjoining squares, which is done by an ice spade dropped into the grooves. In very cold weather the ice yields readily to a slight wedging force. The blocks are sometimes floated through the canals opened in the ice to the shore, where they are hoisted out; and they are also sometimes jerked with a hook at the end of a pole up a slide upon a platform placed at the edge of the opening, and from this platform they are slid along on to the sleds which convey them away. At the ice houses the blocks are raised often by steam power up an inclined plane to the top of the building, and thence let down another plane to any part within where it is required for packing. The storehouses, huge wooden or brick buildings without windows standing around the edge of the ponds or along the banks of the rivers, present a very singular appearance. They are from 100 to 200 feet long and very broad, with a capacity sometimes exceeding 20,000 tons. One at Athens on the Hudson holds 58,000 tons, and two at Rockland lake in Orange co., N. Y., hold 40,000 tons each. Around Fresh pond in Cambridge,

Mass., there are some 50 of these buildings. Between their walls they are filled in with tan, dried leaves, rice hulls, hay, shavings, or saw dust; and the blocks of ice are also packed with the same materials to good advantage, excluding the air as much as possible. Thus the refuse materials of the saw mills are brought into use, and the dust that was formerly an obstruction to the mills in Maine is now sold to considerable extent for preserving ice, and is brought to Boston for this purpose. In packing the ice it is found advantageous for long keeping to place the blocks upon their edges rather than upon their flat sides. As the season of the ice harvest is short and uncertain, the gathering of the crop is conducted with the greatest activity at favorable times. The ponds present a busy scene by day, with the crowds of men pressing forward their various operations with their horses and curious machines. But in the clear cold nights, when the work is still continued by the light of the moon, the interest is greatly heightened by the contrast of life and activity, noise and bustle upon the ice, with the darkness of the open water around and the gloom and stillness of the surrounding forests. No time is suffered to be lost. The men by their great numbers are sometimes able when assisted by the steam engine to take out and store 600 tons of ice in an hour; and several parties are often seen thus engaged upon the different parts of the same pond.

ICE PLANT (*mesembryanthemum crystallinum*, Linn.), the common name of a plant originally brought from the Canary islands, where its seeds reduced to powder are said to have been used by the aborigines as an article of food. In Spain it used to be largely cultivated in order to procure alkali for making glass; and in one year the value of the exports of its ashes from the Canary islands amounted to about \$120,000. Each plant spreads over the ground from a small, central, fibrous, woody root, and has numerous succulent branches covered with large, tender, and succulent leaves, the cuticle of both being elevated into many crystalline points, whence its name. The flowers are very small and sit closely upon the stalks; they consist of a few linear white petals rising out of broadly ovate, acute, retuse calyx leaves, of little beauty, and only produced in abundance under cultivation in the garden during continued pleasant weather. The plants are readily raised from seeds sown in a frame, or even in flower pots kept in some sunny window of the sitting room; if thus treated with early sowing the plants can be forwarded for planting out by the middle of May or first of June. It is best to select some dry, bare, sunny spot, allowing each plant abundance of room.

ICEBERGS AND ICE ISLANDS, floating masses of ice gathered on the coast of polar regions, and set adrift by force of winds and currents. Many icebergs are produced from glaciers, which, thrust down from the elevated snowy lands in the interior, are moved onward into

the deep waters, where the fragments broken off from the advance border are floated away. The edges of glaciers extending many miles along a precipitous coast have been seen to fall with terrific violence into the sea beneath, and at once be transformed into floating islands of ice. These carry with them the masses of rock gathered up by the ice in its progress as a glacier, and transport them to new localities in warmer latitudes. (See *DILUVIUM*, and *GLACIER*.) Ice islands of vast extent are also produced by the breaking up of the great fields of sea-made ice, which accumulate along the shores of the frigid waters. In the year 1817 the ice covering several thousand square miles of the sea N. of Iceland, and chiefly on the E. coast of Greenland, most of which, it is believed, had not been moved for nearly 400 years, was suddenly broken up and dispersed over the waters of the north Atlantic. Portions of it were carried far to the eastward of the usual range of icebergs from the north, and approached within 800 m. of Ireland, or to long. 32° W. The breaking up of this ice led to the expedition of Capt. Ross, the second of the present century in search of a N. W. passage, the opinion prevailing that the climate had essentially changed, and that the northern seas would continue open. The drift of the northern icebergs is with the great polar currents, one of which sets in a S. S. W. direction between Iceland and Greenland, and another along the W. side of Baffin's bay, meeting the former near the coast of Labrador. They are brought against the American continent and the W. shores of its bays in consequence of not catching at once the more rapid rotating motion of the earth as they pass upon larger parallels, and so allowing this to slip from under them. The greatest numbers are produced on the W. side of Greenland; and, as observed by Dr. Kane, "perhaps the most remarkable place for the genesis of icebergs on the face of the globe" is at Jacob's bight, an inlet on this side a little N. of Disco island, in about lat. 71° and long. 56° . From Labrador the ice is floated with the current past Newfoundland, and meeting near the Great Bank the warming influences of the Gulf stream, it usually disappears about lat. 42° . The extreme limit is in lat. 40° . Sometimes the ice is carried as far to the eastward as the Azores, in lat. 42° . In the southern hemisphere icebergs drift still nearer to the equator, being occasionally seen off the cape of Good Hope in lat. 36° . Were they not checked before reaching a corresponding latitude in the northern hemisphere, they might fall into the current that sets into the Mediterranean through the straits of Gibraltar, chill the waters of that sea, and produce an unwelcome change in its delightful climate. As they reach their southern limit their influence is felt in sensibly cooling the waters of the Gulfstream for 40 to 50 m. around, and on approaching them the thermometer has been known to fall 17° or 18° . When driven, as they sometimes are, in large numbers into Hudson's bay, they

diffuse intense cold over the northern portion of the continent; and, as observed by Capt. Franklin, ice is always found, even in summer, at the mouth of Hayes river at the depth of 4 feet below the surface of the ground, and this in the latitude of the north of Prussia.—The floating masses assume a variety of forms. Some spread out into sheets, which cover hundreds of square miles and rise only a few feet above the water. These are called fields, or, when their whole area can be defined from the mast head, floes. A number of sheets succeeding each other in one direction constitute a stream, or lying together in great collections, a pack. The surface of the sheets is often diversified by projections above the general level, which are called hummocks; they are forced up by the floes pressing against each other, and are sometimes in the form of great slabs supported by one edge. Dr. Kane noticed that these become bent by their own weight, even when the thermometer continues far below the freezing point. The most solid clear ice exhibits this yielding property of its particles. The surface of the ice fields is usually covered with snow, and when the ice is no more than 2 feet thick it gives no trace of salt on the surface. The thicker ice contains open pools of fresh water. The bergs are real floating mountains of ice, rugged and picturesque, with peaks jutting high into the air, and strange forms in the glittering hard blue ice, which one easily converts into imaginary castles and grotesque architectural designs. They are occasionally seen in great numbers moving on together. Dr. Kane in his first cruise counted 280 in sight at one time, most of which exceeded 250 feet in height, and some even exceeded 300 feet. The dimensions of the largest are measured by miles. Lieut. Parry in the first expedition of Ross encountered one in Baffin's bay, 7 leagues from land, the length of which was 4,169 yards, its breadth 3,869, and its height 51 feet. It was aground in 61 fathoms. Its cliffs recalled those of the chalk on the coast of England W. of Dover. Dr. Kane saw one aground in soundings of 520 feet, which with every change of tide swung round upon its axis; and Capt. Ross describes several he saw aground together in Baffin's bay in water 1,500 feet deep. The officers of the French exploring expedition in the Southern ocean measured several bergs from 2 to 5 miles each in length, and from 100 to 225 feet high. Capt. Dumont d'Urville reports one in the Southern ocean 13 miles long, with vertical walls 100 feet high. The portion of these masses of ice seen above the water is only about an eighth part of their entire bulk. Such bodies, weighing hundreds of millions of tons, moved on by a broad current of water, exert a power against obstacles of which we can form little idea. In their action upon the bottom of the sea, as explained in the article *DILUVIUM*, many geologists recognize a repetition of the phenomena accompanying the distribution of the drift formation, and the production

of its sands and gravel and rounded bowlders. Dr. Kane remarks of the display of power exhibited by the movement of these huge bodies as follows: "Nothing can be more imposing than the rotation of a berg. I have often watched one, rocking its earth-stained sides in steadily deepening curves, as if to gather energy for some desperate gymnastic feat; and then turning itself slowly over in a monster somerset, and vibrating as its head rose into the new element, like a leviathan shaking the water from its crest. It was impossible not to have suggestions thrust upon me of their agency in modifying the geological disposition of the earth's surface."—Icebergs occur in great numbers in the North Atlantic in the latter part of the summer, and form the chief danger which then besets the navigation between Europe and North America.

ICELAND, a large island in the Northern ocean, subject to Denmark, geographically belonging to the western hemisphere, and distant from Norway about 650 m., from the Shetland islands and Scotland 500 m., from the Färöe islands 250 m., and from Greenland 160 m. It is situated between lat. $63^{\circ} 20'$ and $66^{\circ} 35' N.$ and long. $13^{\circ} 25'$ and $24^{\circ} 31' W.$; greatest length 325 m., greatest breadth 200 m.; area, 41,000 sq. m. The population of Iceland in its more flourishing epochs exceeded 100,000. The results of several censuses of modern times are as follows: 1840, 57,094; 1845, 58,558; 1850, 59,157; 1855, 64,603. Reikiavik, the capital, has a population of only 1,500. The island is of volcanic origin, and consists of a mass of plutonic rocks, whose more prominent upheavals have taken the shape of tolerably well defined ranges of mountains running from N. E. to S. W. The coast line is generally rugged, and is indented, especially on the N. and W., with long, deep, and narrow bays or fiords. The highest mountains are: Oeräfa Jökull, 6,241 Danish feet; Snäfell, 5,808; Eyjafjalla Jökull, 5,432; Herdubreid, 5,290; Vatna Jökull, 5,000; Hecla, 4,961. The chief streams are the Jökullsa, Lagarfljot, and Skjaldfjandafliot in the N. E., and the Thiorsa in the S. W. The lakes are neither large nor numerous, the most noticeable being the Myvatn in the N., and the Fiskivatn, Hvitavatn, and Thingvallavatn in the S. In the interior, upon an extent of thousands of square miles, the eye beholds nothing but the vestiges of volcanic destruction. Deep abysses formed by extinct craters are surrounded by immense fields of lava which has filled the beds of lakes, and has transformed fertile valleys into stony deserts. Then follow tall conical hills of ashes, and, scattered between them, gigantic rocks or blocks of ice; again a steaming pool, at the bottom of which masses of sulphur are boiling and bubbling; still further on, a mammoth cave, its stalactites glazed over with ice, and vast fields of brimstone, honeycombed by hot springs, and producing an unearthly noise not unlike that of thousands of steam boilers combined; then glaciers, a smoking volcano whose subterranean

thunders have for years been announcing a fearful eruption, and boiling fountains throwing up their grand columns of hot water with a roaring din like that of a hundred cannons. Such are the most prominent features of the natural scenery of Iceland, the grandest, the most appalling scenery to be found in the world. (See GEYSERS.) Mount Hecla is situated in the S. W. part of the island, in the Rangarvallasysla, in lat. $63^{\circ} 59' N.$, long. $19^{\circ} 42' W.$, about 10 m. from the S. coast. Its height is 4,961 Danish, or 5,104 English feet. Its eruptions take place every 70 or 80 years, according to WALTERSHAUSEN (*Skizze von Island*), but the Icelandic records mention no fewer than 43 since A. D. 900. Pliny Miles, who ascended the mountain in 1852, gives in his "Rambles in Iceland" a list of 24 eruptions which have occurred since 1004, at intervals varying from 6 to 76 years, the two last being in 1766-'8 and 1845-'6. Mount Hecla has the appearance of an elongated ridge, with a single conical peak, on the side of which lie in a row 4 great craters, which were opened in 1845-'6. On the summit is a 5th, the principal crater of the mountain. It is a long irregular chasm, nearly $\frac{1}{4}$ of a mile long, 300 feet wide, and 200 or 300 feet deep. It has been silent for ages, and may be entered with safety. The bottom consists of volcanic sand and moist earth, emitting little heat, and in some places covered with snow, but from fissures in the rock lava, slags, and scoriæ which form its sides, issue smoke and hot steam. The craters more recently opened are filled with dark smoke, sulphur, and red cinders, and streams of lava thrown out in 1845 were found yet hot after an interval of 7 years. A lava stream formed by that eruption was 8 geographical miles long, and in some places more than 2 m. wide. On the summit the ground feels warm to the feet; on digging to the depth of 6 inches smoke bursts out, and smoking heaps of lava are scattered over the surface. The top of the mountain is nearly flat, forming a broad table, $\frac{1}{4}$ of a mile by 50 rods across. The Skaptar Jökull is a name given to a mountain group over 100 m. in diameter at the base and 330 m. in circumference. It presents from different points of view the appearance of several distinct mountains. The Oeräfa Jökull and Vatna Jökull are 2 of its highest peaks. It is accessible only in a few places, and from the summit of Hecla presents the appearance of one vast elevated plain of ice and snow. A terrific eruption of this mountain took place in 1783, preceded by the sudden formation some 70 m. off the coast of a volcanic island, which disappeared in the course of a year, and by violent earthquakes, clouds of smoke, and showers of ashes, which are said to have been carried to places on the continent 2,000 m. distant. The snows were melted, causing a heavy freshet, and on June 10 the streams of lava burst forth. In 24 hours the bed of the Skapta river was dried up, and a torrent of lava filled it. The fiery flood lasted 3 months, and the eruption continued

until Feb. 1784. The lava covered a tract of country 500 sq. m. in area. The principal mineral productions are sulphur, which occurs in large quantities at Husavik on the N. coast and elsewhere, and the feldspar used in commerce, which is found imbedded in the amygdaloid tracts of the E. portion of the island.—The cold, bleak climate and barren soil of Iceland are so repulsive to the inhabitants of a more temperate zone, that it appears almost miraculous how a high state of civilization could ever have existed there. The summer is very short, and nearly all the rest of the year is a severe winter. In the month of June one may still ride over the frozen bays and inlets, and it is recorded that in 1758 the island was surrounded by an immense wall of floating ice as late as the month of August. The mean annual temperature is only 41° F., and is gradually decreasing from year to year. Varieties of grain which were raised in former centuries do not now grow there. Scarcely a tree or large shrub is to be seen, and even in the most favorable years the vegetation is extremely poor and stunted. A few groves of hardy birch occur in the more sheltered valleys, and now and then in the south a stunted willow is met with. The ancient forests have disappeared, and the only traces of them are the deposits of semi-carbonized wood, known as *surturbrandur*, which is occasionally used as fuel or for the manufacture of articles of furniture. The *lichen Islandicus*, or Iceland moss, is exported in considerable quantities. A stout, thick grass, growing in the short, well watered valleys which open toward the ocean, enables the inhabitants to raise an inferior quality of horses, cattle, and horned sheep. Cabbage, turnips, lettuce, spinach, parsley, radishes, cresses, flax, and a few potatoes are raised in carefully cultivated garden plots. The number of these gardens has increased since the beginning of the century from a few hundred to 6,063. About $\frac{2}{3}$ of the surface is capable of cultivation, and $\frac{1}{3}$ consists of pasture lands inaccessible during part of the year. The reindeer, having been introduced from Norway about 100 years ago, roams through the island in large herds. The fox is the only other animal found in a wild state. The ocean and the rugged cliffs furnish the islanders with fish, birds, and eggs for food. The erne, gull, ptarmigan, snipe, swan, falcon, eider duck, and many other land birds and water fowl, are abundant. The salmon, cod, haddock, herring, and flounder are the principal varieties of fish. The number of neat cattle on the island at the close of 1853 was 24,067, of sheep 489,932, and of horses 40,389. The fisheries off the coast employ 3,498 boats belonging to natives of the island. Scanty as the means of subsistence are, they are not even to be relied on by the inhabitants. They are continually threatened by the numerous subterranean furnaces on the one hand, and by storms and spring floods, carrying devastation far up into the inhabited valleys, on the other. Thus famine in its most terrible form has frequently

visited the island, and the horrors of pestilence have been added to those of utter destitution. In 1707, for instance, 16,000 inhabitants, full one third of the entire population, were carried away by the small pox, and a few years later 10,000 became victims of famine. During the terrible eruption of the Skaptar Jökull in 1783-'4, no fewer than 11,000 people died from destitution and pestilence; and 20,000 horses, 7,000 head of cattle, and 130,000 sheep were starved to death.—That such circumstances must have stamped distinct national characteristics on the inhabitants is natural. The Icelanders, descendants of the old Northmen, whose ancient language they have preserved in its purity, are of small stature, but of a strong muscular development. Their appearance is not prepossessing, but their moral qualities cannot be too favorably spoken of. Hardened by an almost continuous strife with the elements, the Icelfander is proud and seemingly cold, and not communicative under ordinary circumstances, though always hospitable; his honesty, temperate habits, chastity, and piety deserve the highest praise. An Icelandic clergyman has said of his countrymen: "The extreme poverty of our people is one of the principal causes of this morality." But it is truly added by a German author who quotes this remark: "There must be a strong moral foundation beforehand, for poverty to have such an effect. Otherwise it produces a very different result." There is scarcely any country where a general education is so highly esteemed as in Iceland. It would be difficult to find an Icelfander not able to read and write. With their old national sagas and poems they are all familiar. A library is connected with each church, where the members obtain books or manuscripts (which are still used to some extent in place of printed books) for reading at home. During the long winter evenings the whole family and servants are assembled in a cheerfully warmed room, doing the necessary handiwork, and at the same time listening to their old histories or to rhymed versions of the historical books of the Old Testament, which the head of the family or one of the elder sons recites to them in the same half-singing tone used by the skalds of old, a thousand years ago. The habitations consist of low huts, built of turf or lava, painted red, and thatched with sod. There are no dense settlements except near the sea shore. Fishing, hunting (after birds, chiefly for their feathers), and cattle raising are the principal occupations of the Icelanders. Of manufactures there are none but the simplest branches of domestic industry, spinning and weaving. The laborious and dangerous occupations of the male inhabitants tend to shorten their life. Very aged persons are rare, but on the other hand the fecundity of the women is remarkable; a mother of 12 or 15 children is not at all uncommon. The principal food of the Icelfander is dried fish and milk; bread is a luxury which the wealthy only can afford to use; a kind of meal is prepared

from the Iceland moss. The cattle are sometimes fed with crushed fish bones when grass is wanting. The deprivations which the people suffer when ice or storms prevent them from going out to sea fishing, are of the most serious kind, and not unfrequently engender disease, if not actual starvation. Iceland has 321 churches, 184 ministers, and one bishop, all Lutheran. Common schools are connected with all the churches, but there is only one college on the island, at Havneseord. At Reikiavik, the seat of the government, there is a library containing 10,000 volumes, and an observatory. Three or four journals are published regularly in different parts of the island.—The executive government is in the hands of a governor and 3 deputy governors, one for each of the departments into which the island is divided, all appointed by the king of Denmark. Each county, of which there are 20, has its court, from whose decision there is an appeal to the supreme court at Reikiavik. The legislative power is intrusted to the *althing*, which assembles once in 2 or 3 years, and upon all of whose acts the king possesses the privilege of an absolute veto. The *althing* is composed of 26 members, 6 being appointed by the sovereign, and one chosen from each county by the people. The governor, the chief justice, and the executive secretary are also entitled to seats. The journals and laws are published immediately after the close of each session, and distributed among the people. The total receipts of the government in the fiscal year 1856-'7 were 31,995 Danish dollars, and the expenditures 52,437, the deficit being paid by the home government. This difference, however, is rapidly decreasing; for in the last fiscal year the receipts rose to 33,473 dollars, while the expenditures sunk to 44,626. The receipts are derived from taxes on the fisheries, property taxation, and the rent of crown lands. The commerce is small. The leading articles of import are rye, barley, flour, coffee, liquor, tobacco, sugar, salt, beans, iron, coal, hemp, and tar. In 1855 were imported of corn (all kinds), 40,688 Danish barrels; liquor, 447,699 quarts; coffee, 426,980 lbs.; sugar, 457,231 lbs.; tobacco, 108,880 lbs.; salt, 20,342 barrels; coal, 32,000 chaldrons. The imports of 1855 were carried to Iceland by 125 ships, 13 of which were English, Norwegian, and Spanish, the remainder being Danish. They were consigned to 90 different mercantile houses, of which a little less than one half were foreign houses. The chief exports are fish, fresh, salted, and dried, wool, tallow, cattle, sheepskins, horses, wild fowl, feathers, eider down, Iceland moss, and sulphur. In 1855 were exported of fish (all kinds), 7,705,280 lbs.; wool, 1,596,323 lbs.; tallow, 932,906 lbs.; mittens and socks, 110,000 pairs.—Iceland was discovered by Naddod, a sea rover, in 860. Its colonization was commenced in 874 by Ingolf, a Norwegian chief. In the latter part of the 9th century a great revolution took place in Norway. Harold the Fair-haired, a ruler of one of those petty kingdoms which then divided that country into a score

of independent realms, was enabled by consummate statesmanship and great military skill to subdue all his brother monarchs. The successor of the new sovereign, St. Olaf, became a convert to Christianity, and the conquered kings and chiefs were subjected not only to civil oppression but to religious persecution. The haughty chieftains, who clung to the faith and freedom of their fathers, were forced into rebellion and exile. The wealthier ones, who were able to make the distant voyage, sought refuge in Iceland; and before 930 the island contained many thousand hardy and intelligent settlers, who adopted, with some modifications, the form of government under which they had lived at home. By the influence of Ulfiot, the most prominent Iceland of his day, the whole island was brought under the rule of one great legislative body called the *althing*, which met first in 930, and thereafter annually, in the plains of Thingvalla in the south. The executive power was intrusted to a *lagmadur*, or president, chosen by the national assembly. A code of jurisprudence was compiled, which was amended at various times, and in which the system of trial by jury was for the first time fully developed, the territorial rights of each inhabitant were strictly defined, and the powers and privileges of the priesthood, a class which was generally identical with the highest civil rank, were carefully marked out. The republic endured till the middle of the 13th century, and forms the golden period of Icelandic history. It was under the republic that the Icelanders maintained an important commerce with the mother country. Their adventurous navigators penetrated through the Mediterranean to the Black sea on the one hand, and, on the other, discovered and settled the sterile coast of Greenland, and are supposed to have made voyages to Vinland or the southern coast of New England 5 centuries before Columbus. Their warriors served in the body guards of the Cæsars of Byzantium, and fought under the banners of the earliest Muscovite czars. Their skalds or poets and their chroniclers visited all the northern courts from Novgorod to Dublin, and formed a literary class which kings delighted to honor. A series of statesmen of great ability ruled or influenced the national councils, among whom were Thordur Gell, Njal, Skaptur, Hafidur Marsson, Bergthor, Snorri the Good, and Einar Thveraelng. Christianity was introduced in the year 1000, and was soon established by the *althing* as the national religion. In the latter half of the 12th century jealousies began to spring up among the party leaders. These were carried to such an extent during the first half of the following century, that resort was often had to arms. These difficulties resulted in rendering the island an easy prey to the Norwegian kings, who had long looked upon it with covetous eyes. But the loss of its independence, though the greatest, was not the only evil which Iceland was now compelled to undergo. Severe pestilences raged and destructive eruptions of

volcanoes occurred. These inflictions almost crushed the spirit of the people, but now and then the old love of liberty broke out. Its last exhibition was in the case of Jon Arason, the last Roman Catholic bishop of the island, who endeavored to oppose by arms the encroachments of the Danes, who by the annexation of Norway became in 1380 the possessors of Iceland. With his defeat and execution in 1550 the last hope of freedom died away. Now followed more than two centuries of oppression and neglect on the part of the home government. All power was transferred to a foreign governor; the trade was placed in the hands of a monopoly; and the old customs and institutions were gradually overthrown. The publication of the old sagas by native scholars, and by Swedish and Danish antiquaries, produced in the latter half of the 18th century a literary revival, which was soon followed by a political awakening. Some of the worst features of the Danish commercial monopoly were abolished before the close of the century, and since 1800 the progress of the island in every part has been rapid. A singular episode in the political history of Iceland occurred in 1809, when a former Danish sailor, Jörgen Jörgenson, appeared with two privateers before Reikiavik, captured the Danish governor, and established an independent republic of Iceland (June 21). He resided in the government house, where he surrounded himself with a body guard of sailors. But his rule lasted only two months. In August the flag of the republic (representing 3 cods) was hauled down by the British, and Jörgen himself made a prisoner. The island was visited by volcanic eruptions in 1821 and 1823, by famine in 1824 and 1825, and in 1827 epidemic diseases reduced the population to 40,000, since which time it has increased rapidly. Public opinion forced the Danes in 1845 to restore the old parliamentary body or *althing*, and in 1853 the trade was thrown open to the competition of all commercial nations. A steady improvement is visible in population, agriculture, industry, and education.—See "An Historical and Descriptive Account of Iceland," &c. ("Edin. Cab. Lib.," 1 vol., 1840); Gaimard, *Voyage en Islande et en Gröenland* (6 vols. 8vo., Paris, 1839-'43); Ida Pfeiffer, "Journey to Iceland" (New York, 1852); Pliny Miles, "Rambles in Iceland" (New York, 1854.)

ICELAND, LANGUAGE AND LITERATURE OF. The *Íslensk tunga* is the oldest of all living European languages, and the most northerly of all civilized idioms. It is wonderfully rich in roots, as well as in grammatical forms. Its filiation is indicated in the articles on the Danish (see DENMARK, LANGUAGE OF), Frisian, German, and Gothic languages. Owing to the seclusion of its area from contact with the whirlpool in which other tongues are tossed about, it has been but little altered from the Norræna, especially in the interior of Iceland. It is soft and sonorous, free from Germanic guttural and other harshness, and from English hisses and compressed sounds like those of *j*,

ch, &c., only the *h* being aspirated. Its grammar is akin to that of the Gothic. Before the introduction of Christianity (1000) *Rúnir* (lines, speech) were the characters used in writing. They consisted of 16 letters, the sounds of which were indicated by the initials of their names, viz.: *Fie*, flock; *Ur*, torrent, sparks; *Duss*, thorn; *Ois*, mouth, port; *Ridr*, rider; *Kou*, ulcer, boil; *Hagl*, hail; *Naud*, need; *Is*, icicle; *Ar*, year; *Sól*, sun; *Tyr* (Lat. *taurus*), bull; *Biarkan*, birch; *Lagur*, liquor; *Madr*, man; *Yr*, cow. To these were added 7 *stungen* (stung, pointed) letters, viz.: *stungen Kaun* or *Knesol* for G, *stungen Is* for E, *stungen Biarkan* for P, *stungen Duss* for Th, *stungen Fie* for V, and *stungen Yr* for W. Subsequently the Icelanders adopted the Latin alphabet, at first with its angular shapes (the pseudo-Gothic), but recently with the Latin. The number of letters is 28, viz., the 25 English, omitting *w*, and 3 particular letters after *z*, viz.: þ (English *th*), æ, and ø (German *ä* and *ö*). Instead of *q* and the hard *c* the letter *k* is now frequently used.—We subjoin the most noteworthy grammatical features. Substantive nouns are declined either indefinitely or definitely. The terminations of the indefinite declension are as follows: singular—genitive, *a*, *s*, *ar*, *ur*; dative, *a*, *i*, *u*; plural—nominative, *u*, *ar*, *ir*, *ur*; genitive, *na*, *a*; dative, *um*; accusative, *u*, *a*, *i*, *ir*, *ur* (arranged into 8 groups). The cases of the definite declension are formed by suffixing the demonstrative *hinn*, he, *hín*, she, *hitt*, it, which drop the *h* and sometimes *hi*; thus: *ridr-inn*, wood-the; *dygd-in*, Germ. *Tugend-die* (as it were *Tugend-in*); *auga-t*, Germ. *Auge-das*; the suffix receives the signs of cases. There are 3 genders, as follows: singular, masc. *frómr*, pious, upright; fem. *fróm*, neuter *frómt*; plural, *frómir*, *frómar*, *fróm*. Degrees: comparative, masc. and fem. *frómari*, neuter *frómara*; superlative, masc. *frómaster*, fem. *frómust*, neuter *fromast*. The following are anomalous: *gódr*, *betri*, *bestr*, good, better, best; *illr*, *verri*, *estr*, ill (bad), worse, worst; *gamall*, *ellðri*, *ellztr*, old, &c.; *margr*, *fleri*, *flestr*, much, more, most; *mikil*, *meiri*, *mestr* (Lat. *magnus*, *maior*, *maximus*), great, &c. Numerals: 1, *einn*; 2, *teir*; 3, *þrír*; 4, *fiórir*; 5, *fimm*; 6, *sex*; 7, *síð*; 8, *átta*; 9, *níu*; 10, *tíu*; 11, *elflu*, &c.; 20, *tutugu*, &c.; 40, *firutíu*, &c.; 100, *hundrað*; 1000, *þúsund*, &c.; *bádir*, *báðar*, *báði*, both; *fyrsti*, first; *annar*, another, &c. Personal pronouns: 1st person—*ek*, I, gen. *min*, dat. *mer*, accus. *mik*; dual, *við*, gen. *okkar*, dat. *okkr*, we two, &c.; plural, *vér*, *vor*, *oss*, we, our, us; 2d person—*þú*, *þín*, *þér*, *þik*, thou, &c.; dual, *þið*, *yckar*, *yckr*, ye two, &c.; plural, *þér*, *yðar*, *yðr*, you, &c.; 3d person—*sin*, *sor*, *sik* (Lat. *sui*, *sibi*, *se*), *hann*, *hún*, *þat*, he, she, it. Relative and interrogative pronouns: *heer*, *heert*, who, what; *heartreggi*, each; *nockr*, somebody; *mangi*, nobody.—Verbs have two voices, two simple tenses, and moods as in English. There are two kinds of conjugations, the one ancient (organic, strong, and metaphonic), the other modern (so called regular,

weak, with suffixes). The preterite perfect, pluperfect, future, and conditional, are periphrastic by means of auxiliary verbs. We subjoin examples of strong verbs in five classes: 1. (*At gefa*, to give; *gífr*, (I) give; *gaf*, gave; *gefi*, Germ. *gäbe*, *gefinn*, given. 2. *Falla*, (to) fall; *fellr*, (I) fall; *féll*, fell; *félli*, Germ. *fiel*; *fallinn*, fallen. 3. *Skína*, (to) shine; *skín*, (I) shine; *skéin*, shone; *skíni*, Germ. *schien*; *skínit*, shone. 4. *Íltaupa* (Germ. *laufen*), (to) run; *hleypr*, (I) run; *hlíóp*, ran; *hlypi*, Germ. *liefe*; *hlaupinn*, run. 5. *Friösa*, (to) freeze; *frys*, (I) freeze; *fraus*, froze; *frysi*, Germ. *friere*; *frosinn*, frozen. There are four classes of weak or regular verbs, with a few metaphonies, conjugated with the following suffixes: infinitive, *a*, as (*at*) *elsk-a*, to love; participle, *andi*; imperative singular, 1st and 3d persons *i*, 2d *a*, plur. *um*, *id*, *i*; indicative present, 1st person *a*, 2d and 3d *r*, plur. *um*, *id*, *a*; imperfect, *ada*, *adír*, *adi*, *udum*, *adud*, *idu*; subjunctive, 1st and 3d persons *i*, 2d *ir*, plur. *um*, *id*, *i*; imperfect, 1st and 3d *adi*, 2d *adír*, plur. *udum*, *adud*, *adi*. All forms of the passive voice end in *st*, without any auxiliary verb. Auxiliary verbs: *hafa*, to have; *munu*, also *skulu*, shall, of the future; *verða*, Germ. *werden*, Lat. *fieri*; *vera*, to be (*veri*, Lat. *esto*), *em*, *ert*, *er*, am, art, is; *erum*, *erud*, *eru* (we, ye, they) are; *var*, was; *sé*, *sért*, *sé*; *séum*, *séud*, *séu*, Lat. *sim*, *six*, &c.; *vári*, *essem*, &c. The formation of parts of speech, derivation, and composition are very manifold, by means of many suffixed particles, and by some prefixes.—The art of versification is very ancient in Iceland, the oldest and most frequent form being alliterative; for instance:

Farvel fagnadar

Farewell joy

Föld og heilla.

Full and holy (land).

Verses were also made by assonance, according to quantity, or in rhyme; so that including the various combinations of all these modes, there were more than 300 forms of versification. The first of all was the *Fornyrðalug* (ancient structure), of which the following, from the *Hávamál* of the Edda, with a Latin rendering, is an example:

Veistu ef þu vinn átt

Scis-tu an (Eng. if) tu amicum habes,

þann þu vel trúir,

Cui tu bene (well) fidas,

Ok villtu af honum gott géta:

Ac vis-tu ab hoc bonum acquirere (Eng. get):

Góði skalttu við þann blanda.

Animam debes-tu cum ejus (anima) miscere (blend),

Gjöfum skipta,

Dona (gifts) dividere,

Ok firtu at finna opt.

Ac ire invisere sæpe (oft).

—Troil, a Swedish bishop, found four varieties of the Icelandic idiom in different localities. The old language also differs from that of later times, being purer, clearer, and more concise. The modern language is corrupted by a mixture of Danish, English, Dutch, French, and other

words and expressions, especially on the sea shore. On the Färöe islands the Icelandic language is poorer in forms, though rich in archaisms. It shows these characteristics also in the once traditional, heroic poems, edited by H. C. Lyngbye (1822) and V. U. Hamerschaimb (1851). The Orkneys and Hebrides, the coasts of Scotland, and those of Greenland, offer also traces of this interesting language. Already before the union with Denmark (1380), and still more after it, both the language and the arts and sciences, which had been cultivated during the sway of Norway, declined very much; but they rose again in consequence of the introduction of the art of printing (1531). The language gained by poetry and by elementary books for the use of the people; but sciences were treated in Latin or Danish.—For Icelandic grammars and dictionaries, see Run. Jóna, *Recentissima Linguae Septentrionalis Incunabula*, i. e., *Grammatica*, &c. (1651); *Epitome Grammatices Latino-Islandicæ* (1734); R. K. Rask, *Veitðning til det Islandske eller gamle Nordiske Sprog* (1811); Gudm. Andrea, *Lexicon Islandicum* (1683); Biörn Haldorson, *Lexicon Islandico-Latino-Danicum*, edited by R. K. Rask (1814); G. P. Marsh, "Grammar of the old Northern or Icelandic Language" (Burlington, 1838); Sveinbjörn Egilsson, *Lexicon Poeticum Antiquæ Linguae Septentrionalis* (1856-'9).—The Icelandic literature, which, with the exception of a few unimportant Norwegian productions, was written wholly in Iceland or by Icelanders, may be divided into two very marked periods, the ancient and the modern. The first terminated a century after the fall of the republic; the other comprises the period intervening between that date and the present time. Soon after the settlement of the island the genial influence of free government caused a marked development of the national spirit, which was early exhibited in the field of letters. The climate, too, had much to do with it. In the long evenings of a long winter, an intelligent people, prohibited by the severities of the season from outdoor avocations, would naturally have recourse to the charms of literature; and as soon as the introduction of Christianity brought with it the knowledge and use of the Latin alphabet, the earliest employment of the new gift was in writing out the pagan songs which had been orally transmitted from one generation to another. In such a manner did the priest Sæmund Sigfusson, called "the learned" (1056–1133), compile that sublime compendium of heathen wisdom and mythological lore, known as the elder or poetic Edda. (See EDDA.) Beside these religious effusions, the poetry that has come down to us from the days of the republic consists generally of songs of victory or of praise, elegies, and epigrams, in which latter the old skalds especially excelled. The most noted skalds of the 10th century are Bersi Torfuson, Egill Skallagrímsson (904–990), Eyvindur Finnson, Glumur Geirason, Kormakur Oegmundarson (died 967), Gunnlaugur Hromun-

darson (983-1012), Hallfredur Ottarson (died 1014), Thordur Sigvaldaskald, and Thorleifur Hakonaraskald. The 11th century was very prolific of poets; we have Arnorr Thordarson, Einarr Helgason, Eiríkur, Gísli Illugason, Oddur, Ottarr, Sighvatur, Skúli Thorsteinsson, Sneglu-Halli, Hallar-Steinn, Steinn Skaptason, Stufur Blíndi, Thjóðolfur Arnórsson, Thorarinn, and Thordur Kolbeinsson. The 12th century presents the names of Einarr Skúlason, Böðvarr, Hallbjörn, Hallur, Ivarr Ingimundarson, and a host of others. In the 13th century we find scarcely any names but those of Einarr Gilsson, Guðmundur Oddsson, Ingjaldur Geirmundarson, and Ólafur Thordarson, showing that the loss of liberty had begun to affect the labors of the muse. Nor were the historians and romancers less numerous. The sagas properly fall into two classes, the fictitious and historical. Among the former are the *Völsunga Saga*, *Nornargests Saga*, the *Vilkina Saga* (narrating the exploits of Diederich of Bern, and thus belonging to the same heroic cycle as the *Heldenbuch* and *Nibelungenlied*), *Hálfs Saga*, "Saga of King Hrólf Kraka and his Champions," "Saga of King Ragnar Lodbrok" (which contains the celebrated *Lodbrokarkvida*, or "Death Song of Lodbrok"), *Frithiofs Saga*, *Hervarar Saga*, *Oervar Odds Saga*, and Snorro Sturleson's "Younger or Prose Edda." Some of these are in part historical in their character, but it is difficult to distinguish the true from the false. Far more valuable as well as more numerous are the sagas of the historical class. They consist of histories in the largest sense of the word, of local and family histories, and of biographies. Of those which relate to Iceland, the most noted are the *Íslendingabók*, by Ari Thorgilsson (1068-1148); the *Landnamabók*, a detailed account of the settlement of the island; the *Kristni Saga*, a narrative of the introduction of Christianity into Iceland; *Njáls Saga*, a classic composition; *Gunnlaugs Ormstungu Saga*; *Viga Glums Saga*; *Egils Saga*, the biography of a renowned poet and chieftain; *Kormaks Saga*; *Eyrbyggja Saga*, an abstract of which has been published by Sir Walter Scott; *Laxdæla Saga*; *Sturlunga Saga*, a history of the race of the Sturlungar, so important in Icelandic history; and *Grettis Saga*. The chief sagas relating to other countries are: the *Orkneyinga Saga*, a history of the Orkneian jarls; the *Færeyinga Saga*, relating to the Færoes; the *Jomsvíkinga Saga*, an account of the sea rovers, whose seat was at Jomsburg near the mouth of the Oder; the *Knytlinga Saga*, a history of the Danish kings from Harald Blaatand to Canute VI.; the sagas of Ólaf Trygvason, one by Oddur (died 1200), and the other by Gunnlaug; the saga of St. Ólaf; the *Heimskringla*, or "Chronicle of the Norwegian Kings," by the celebrated statesman Snorro Sturleson; and various minor sagas relating to Scandinavia, Russia, Great Britain, and Greenland. The most elaborate codes of law were the *Grágás*, *Jarnsida*, *Jónsbók*, and *Kristinréttur*. Many of the works enumerated in this

list are masterpieces of style, and are still read with delight by the peasant in his turf-roofed cabin under the shadow of Hecla, and by the self-exiled Icelandic scholar in the university halls of Copenhagen. This meagre list also shows the attention paid to the culture of letters in a remote corner of the world, at a time when the whole continent of Europe was sunk in barbarism and ignorance.—The second or modern period of Icelandic literature by no means commences with the termination of the old literature; a long time of utter mental inactivity followed, and the 15th and 16th centuries produced scarcely any thing but a few unimportant religious books. In the 17th century the knowledge of the ancient literature and glory of the island began to revive. Foremost in the movement were Arngrímur Jonsson (Jonas, 1568-1648), Guðmundur Andræ (died 1654), Runolfur Jonsson (died 1654), Arni Magnússon (Magnæus, died 1730), and Thormodur Torfason (1636-1719). The last named, better known under his Latinized name of Torfens, was especially zealous in his efforts to disseminate a knowledge of the early history of Iceland. In theology, Guðbrandur Thorlacísson (died 1627), under whose direction the first complete edition of the Icelandic Bible was issued, Bishop Thorlacur Skúlson, and Jon Vídalín (1666-1720), the author of a popular collection of homilies, were the eminent names; while jurisprudence was represented by Páll Vídalín (1667-1727). But the true revival of letters dates from the middle of the 18th century, and was coincident with the commencement of an increase in population. During the last hundred years no other nation can show so large a proportion of literary men. Finnur Jonsson (1704-'89), author of an elaborate ecclesiastical history of the island, which has been continued by Petur Petursson (born 1808), Hannes Finsson (1739-'96), Jon Jonsson (born 1759), and Arni Helgason (born 1777), were eminent theologians. Antiquities, philology, and the old literature have been largely illustrated by Halldan, Einarson (died 1785), the author of an Icelandic literary history, Björn Haldorssen (died 1794), the compiler of a large Icelandic-Latin lexicon, which was edited by Rask, Jon Ólafsson (1731-1811), S. T. Thorlacius (1741-1815), Hallgrímur Schevving, G. J. Thorkelin (1752-1829), Finnur Magnússon (1781-1847), and Konrad Gíslason (born 1808). An elaborate history of the island, in continuation of the *Sturlunga Saga*, has been written by Jon Espolin (1769-1836). The poetical literature of the period has been rendered remarkable by the names of Jon Thorlacísson (1744-1819), translator of the "Paradise Lost," Bjarni Thorarensen (1786-1841), Jonas Hallgrímsson (1807-'45), Sveinbjörn Egilsson (1791-1852), translator of the *Iliad* and *Odyssey*, Benedikt Gröndal (born 1826), and many others. But the attention of the Icelanders has been largely given to political economy, and the result has been a rapid and marked improvement in the economical condition of the country. Par-

ticularly active in this respect have been Jon Eyriksson (1728-'87), Stephan Thorarinsson (1754-1823), Magnus Stephensen (1762-1833), Bjarni Thorsteinsson (born 1781), Thordur Sveinbjarnarson (born 1786), Baldvin Einarsson (1801-'33), Jon Jonsson (born 1806), Pall Melsted, and Jon Sigurdsson (born 1811). In natural history we find recorded the names of Eggert Olafsson (1726-'68), whose tour through Iceland in company with Bjarni Pálsson is still one of the most interesting works on the subject, O. J. Hjalptin (1782-1840), Jon Thorsteinsson (born 1794), and J. J. Hjalptin (born 1807). Among the younger writers, most of whose political opinions are liberal, are Gisli Brynjulfsen (born 1827), Jon Thordarson, and Magnus Grimsson. The series of transactions published by the *Larðoms-Lista Félag* in the latter part of the 18th century, and the numerous volumes issued within the past 25 years by the *Íslenzka Bókmenntafélag*, or society of literature, are of great value.

ICELAND MOSS (*Cetraria Islandica*, Acharius), a lichen common in the N. of Europe and America. It consists of a tuft of deeply divided and dentate-ciliate margined, leaf-like, cartilaginous stems, flattened out and of a lighter color at their base, but above incurved at their edges, so as to render them channelled; in general color they are of a dark olive brown. The fruit (*apothecia*) is borne upon the extremities and sides of the broadest branches, and is very broad and flat with elevated borders. This fruitful condition is only to be met with in the alpine regions of our northern mountains; when the plants occur upon the lower hills, and more especially in dry exposed pastures, they are uniformly infertile. It is possible that these last mentioned forms may yet prove to be distinct species; to settle this point, however, the occurrence of the apothecia is very desirable. A very bitter principle is resident in the alpine forms as well as in the Iceland moss of the shops; but this is almost wanting in the campestrial sorts. As an alleviative to pulmonary complaints the Iceland moss is well known; the principal part of the stock used in medicine is brought from Iceland and Norway. After the intense bitterness, which readily yields to cold water, has been extracted, boiling water is to be poured upon the mass, when, by keeping up a considerable heat and by several hours' steeping, an abundant and soothing mucilage is given out, and can be used with freedom, the drink being made palatable with a little sugar. Hooker says that after being purged of its bitterness the lichen "is dried, reduced to powder, and made into a cake or boiled and eaten with milk, and eaten with thankfulness too, by the poor natives" of those countries where it grows abundantly, "who consider that the very stones yield them bread." The mucilaginous character is owing to a great abundance of lichen starch. Even the bitter principle is tonic and useful in the treatment of disease. Similar alimentary substances are found in other lichens, resulting from the presence of this kind of starch.

ICHNEUMON (Gr. *ἵχνεω*, to track), a viverrine carnivorous animal, of the genus *herpestes* (Illiger). The cheek teeth are $\frac{6}{6}$; the body is long and the legs short; head small and pointed; ears short and rounded; feet 5-toed, with sharp semi-retractile claws; a large anal pouch, in which the vent opens. Of the several species described, the best known is the ichneumon of Egypt (*H. ichneumon*, Linn.), known also as Pharaoh's rat. It is a little larger than a cat, with a gait more like a marten, and the long tail ending in a divergent tuft; the color of the muzzle and paws is black, and the fur of the body with each hair alternately ringed with brown and dirty yellow. It is an inhabitant of N. E. Africa, especially Egypt. It was adored by the ancient Egyptians for its antipathy to the crocodile, whose eggs it destroys in great numbers; they saw in it the representative of a benign power engaged in the destruction of one of their most troublesome enemies. Its natural food consists of rats, reptiles, birds, and eggs, but it has no special antipathy to the crocodile; the stories about its running into the open mouth of this reptile, passing into the stomach, and destroying it by eating its way out, are absurd fables. It is itself destroyed by foxes and jackals. The ichneumon is frequently domesticated in Egypt, where it is used like the cat in ridding houses of rats and smaller pests; it forms attachments to persons and places, and recognizes with signs of pleasure the caresses of its master. The mangouste of India (*H. mungos*, Linn.) is a little smaller than the ichneumon, of a paler and more grayish color, and with a pointed tail; it possesses a singular antipathy to serpents, which it destroys whenever it can, not hesitating to attack even the deadly cobra de capello; against the bite of the latter it is said to find an antidote in the *ophiorrhiza mungos*, a root which is considered in Ceylon as a specific against the cobra's bite in man. It is as mischievous, and in the same way, as the polecat and weasels. The garangan of Java (*H. Javanicus*, Geoffr.) is chestnut brown, with yellowish white spots; its habits are the same as in the other species, and it is expert in burrowing; it is easily domesticated, and is used for destroying rats.

ICHNEUMON FLY, an extensive tribe of the pupivorous family of hymenopterous insects, of great importance in the economy of nature on account of their destruction of insects injurious to vegetation, and very interesting from the peculiar manner in which this purpose is effected. They are perfect parasites, depositing their eggs within the body of living insects, which are devoured by the larvæ hatched within them. Their forms are various, but they generally have an elongated body, with a terminal, long, divided, bristle-like appendage, and filiform antennæ which have a constant vibratory motion; the prevailing colors are black, rufous, and yellow, with lines and spots of white. The head is prominent; the mandibles corneous; the wings 4, of thin membrane and horny ribs or

nervures, the anterior longest, narrow at the base and dilated at the extremity; the abdomen begins between the 2 posterior legs; the feet are long and slender. It is difficult to detect the sexes except by the ovipositor with which the females are provided; this instrument is short or long according as the eggs are to be deposited in the bodies of caterpillars on the surface of the ground or to be thrust down into their living nidus through a nest or deep crevice; in the former it is retractile and lodged in a groove on the under side of the body, in the latter often longer than the body, consisting of a central oviduct and 2 lateral protecting appendages coming from the last abdominal segment. The eggs are hatched in the body of the larva, and the young consume the fatty matters in the interior of the victim, without injuring the vital organs; many eggs are often deposited within the same larva; the young undergo transformation within the living insect, or eat their way through the skin and spin their pupa cases on the outside, from which after a time they come out perfect insects. The larvæ selected for this deposition are so enfeebled by the parasites that they perish without going into the pupa state. A common example is met with in the large green caterpillar, with a horn on the last segment, generally called the potato worm; this is a favorite nidus for the eggs of a minute black ichneumon fly; the young, hatched within its body and devouring its substance, eat through the skin, and spin their pupa cases so thick upon the outside as almost to cover the back and sides of this 4-inch caterpillar; each case is attached to the skin by a short delicate filament, and the place of exit of each larva is indicated by a black dot; this caterpillar is often seen crawling about and eating, almost covered with a colony of these tiny silvery white pupa cases, from which in about a week the shining ichneumon flies appear; the caterpillar does not enter the pupa state, but dies exhausted. These flies are generally rapid in their movements, and are taken with difficulty except when depositing their eggs; they occur in flowers, on trees and walls, in houses, and wherever the desired larvæ are found. The perfect insects live upon the pollen and honey of flowers, and do not attack other insects except to make a deposit of eggs; they are of all sizes, from a fraction of a line to more than an inch long; the species are exceedingly numerous, there being about 1,500 in Europe alone. The larvæ are without feet, parasitical and carnivorous. The chalcidians, allied to the ichneumon flies, are extremely small; they puncture the eggs of other insects and deposit their own tiny ones in them. We can hardly estimate the benefits conferred upon man by these apparently insignificant insects; their instincts lead them to do for man's advantage what all his contrivances could not effect; to mention only a few destructive insects kept in check by them, the best known are the pine weevils, lackey caterpillars, the grubs of many wood

eaters of their own order, the gall insects, the Hessian fly, and hosts of others which would overrun the forests and fields were it not for the agency of these diminutive creatures.

ICHTHOLOGY (Gr. *ichnos*, a footprint, and *logos*, discourse), the name applied to the modern science of fossil footprints, or ichnolites. See **Fossil Footprints**, and **HITCHCOCK**, EDWARD.

ICHTHYOLOGY (Gr. *ichthys*, a fish, and *logos*, discourse), the branch of zoology which treats of fishes, the lowest of the great divisions of the vertebrated animals. The class of fishes cannot be said to have been arranged in a strictly natural manner by any systematist, and such an arrangement is impossible until their external and internal structure and embryonic development are better understood; and until zoologists are better agreed as to what constitutes family, ordinal, generic, and specific characters, little harmony of arrangement can be expected. Most classifications of fishes up to the time of Cuvier (including his) were based on the organs of locomotion and the external integument; after him appeared the anatomical arrangement by J. Müller, and one is expected from Prof. Agassiz founded on anatomical structure and embryological development. The older systems were very imperfect from the ignorance of fossil forms, which supply many links otherwise wanting in the chain of ichthyological characters. Aristotle, in the 4th century B. C., first reduced ichthyology, as he did the other branches of zoology, to scientific form; he was well acquainted with the structure and external characters of fishes, which he distinguishes from cetaceans, laying special stress upon the organs of respiration and locomotion and the scaly covering; he gives the names of 117 species, entering into interesting details on their habits. Several of Aristotle's disciples added important facts to those of their master. For want of patrons like Alexander, the science of experimental natural history rapidly fell into decline, and the system of Aristotle received no amplification, and hardly any attention; the Romans aided in nothing the progress of ichthyology, and Pliny's writings are mere compilations from Aristotle and his pupils. This system of compilation without observation prevailed until the middle of the 16th century, when Belon, Rondelet, and Salviani laid the foundations of modern ichthyology. Belon gives rude figures of 110 species, Salviani excellent engravings on copper of 99, and Rondelet woodcuts of 234 species, in all three mostly fishes of the Mediterranean. Gesner in the same century borrowed the descriptions of the last mentioned authors, and added some of his own in his *Historia Animalium* (1551-'6), all arranged in alphabetical order without any attempt at method, embracing however many foreign fishes. Numerous voyages of discovery to the East Indies and America made naturalists acquainted with many new forms, and the proceedings of the learned societies in all countries of Europe were filled with anatomical and other descrip-

tions of new and strange fishes. Ray and his pupil Willughby, English naturalists of the 17th century, in their *Historia Piscium* (1686), gave the first attempt at a natural classification of fishes, founded upon the consistence of the skeleton, the form, the teeth, presence or absence of ventral fins, number of dorsals, and character of the fin rays. They divided fishes into cartilaginous and osseous; the former were either *longi* (sharks) or *lati* (rays); the latter were *plani* (flat fishes) or *non plani* (ordinary fishes); the *non plani* were either *anguilliformes* (eel-like), or with a more contracted body with or without ventrals; the fishes with ventrals were divided into *malacopterygii* (soft-rayed), with 1, 2, or 3 dorsals, and *acanthopterygii* (spiny-rayed), with 1 or 2 dorsals. Though their genera are not well defined, the species are so well described that it is generally easy to refer them to their proper place in subsequent systems; the whole number of species is 420. The 2d volume consists of well executed, tolerably accurate plates. This work forms an epoch in the history of ichthyology, which from this time began to assume a methodical arrangement. Passing over Sloane, Catesby, Ruysch, Kämpfer, Plumier, and many scientific voyagers of this period, we come to Artedi in the first third of the 18th century. This Swedish naturalist completed the scientific classification of fishes, commenced by Willughby and Ray, defining genera and giving them appropriate names. In his *Philosophia* he divides the class into 4 orders, founded on the consistence of the skeleton, the branchial coverings, and the nature of the fin rays, as follows: 1, malacopterygians; 2, acanthopterygians; 3, branchiostegous fishes; and 4, chondropterygians (sharks, rays, and sturgeons). He made a 5th, including cetaceans, which is inadmissible, and the 3d is badly characterized; the 3 others are to a certain degree natural. In his *Genera Piscium* he gives names and distinctive characters of 45 genera, founded on the number of branchiostegous rays (of which he was the first to see the value), on the position and number of the fins, on the parts supplied with teeth, on the form of the scales, and on the shape of the stomach and caecal appendages; most of these genera stand at the present day. In his *Synonymia Piscium* he gives the synonymy of 274 species. Though borrowing much from Willughby, Artedi added much of the greatest value; his works were published after his death by Linnæus, his early friend, at Leyden, in 1738.—Linnæus, in the 1st edition of the *Systema Naturæ* (1735), followed Artedi; but in the next (1740) he began to give the number of the fin rays, a method of distinguishing since found of great value. In his 10th edition (1758) he trusted to his own knowledge, creating a new system, defining genera more clearly, and using a scientific nomenclature; the most important change was in removing cetaceans from the class of fishes, in which after the time of Aristotle they had been placed, and in uniting them with viviparous

quadrupeds into the class *mammalia*. Brisson, in 1756, had already separated them from fishes. Linnæus, however, committed the error of placing the chondropterygians among reptiles, under the title of *amphibia nantes*, to which in the 12th edition (1766) he had added the *branchiostegi* of Artedi (*ostracion*, *lophius*, *tetrodons*, &c.). He also suppressed the division of fishes according to the nature of the fin rays, and substituted one founded on the presence or absence of the ventral fins and their position in reference to the pectorals, a method which violates many of the true relations of these animals. Before this time Gronovius had published his *Museum Ichthyologicum* (Leyden, 1754-'6), describing 53 genera according to the system of Artedi, and his *Zoophylacium* (1763), with 78 genera, divided into *chondropterygii*, *branchiostegi*, and *branchiales*, arranged according to the position of the ventrals and the number and character of the dorsals. Linnæus in his 12th edition describes 414 species, some of which were taken from Gronovius, from descriptions of various cabinets of his time, and from voyages and scientific journals. In the system of Klein, which Linnæus must have purposely ignored in a spirit of retaliation, as contained in his *Missus Historiæ Naturalis Piscium promoveandæ* (1740-'49), 61 genera are described; the divisions are made according to the shape of the body and head, and the number of the dorsals and branchial openings, and the openness of the latter; it contains some new species, good figures, and true generic groups. Though Linnæus neglected some of the genera of his contemporaries, and distributed his orders in an unnatural manner, describing only 480 species, his precision of definition and the excellence of his binary nomenclature were of great advantage to the progress of ichthyology, and his division into *apodes*, *jugulares*, *thoracici*, and *abdominales* for a long time held its place in the science. Linnæus gave an impetus to the study of natural history, which resulted in making it interesting to all classes, and in inspiring kings with a desire to extend its domain; national expeditions were fitted out by England, France, Denmark, and Russia, which came back laden with treasures of the deep for naturalists; among the workers in this great field we can only mention the names of Commerson, Sonnerat, Pennant, Banks, Solander, the Forsters, Forskal, Steller, Otho Fabricius, O. F. Müller, and Thunberg; the scientific journals teemed with descriptions of new species of fishes from all parts of the globe.—The next great contributor to ichthyology was the German naturalist Bloch, whose celebrated work on the "Natural History of Fishes" consists of two parts essentially distinct; the first, the "Economic History of the Fishes of Germany," appeared at Berlin in 1782-'4, in 3 vols. 4to., with 108 folio plates; the second, the "History of Foreign Fishes," in 1785-'95, in 9 vols. 4to., with 324 folio plates; both were translated into French in a few years after each volume ap-

peared. Of German fishes he describes 115 species, mostly observed by himself. Little conversant with the anatomy of fishes, some of his genera are based on purely artificial characters, while others are remarkably correct. He follows the method of Linnaeus, bringing back the *amphibia nantes*, however, into the class of fishes, and dividing them, with Artedi, into *branchiostegi* and *chondropterygii*. Toward the end of his life he prepared a general ichthyological system, which was published after his death, edited by Schneider, in 1801, in 1 vol. 8vo. with 110 plates; in this he conceived the singular idea of classifying fishes according to the number of the fins, and on this principle makes 11 orders, adopting the Linnæan divisions of *jugulares*, *thoracici*, *abdominales*, and *apodes*; these orders are: 1, *hendecapterygii*; 2, *decapterygii*; 3, *enneapterygii*; 4, *octapterygii*; 5, *heptapterygii*; 6, *hexapterygii*; 7, *pentapterygii*; 8, *tetrapterygii*; 9, *tripterygii*; 10, *dipterygii*; and 11, *monopterygii*. This artificial system leads to the approximation in the same order of fishes the most widely separated, and divides others most nearly related; the chief merit consists in the number of new species described, the genera being 113, and the species 1,519.—The 13th or Gmelin's edition of Linnaeus appeared in 1788-'90, a mere compilation by a person but little acquainted with natural history, containing a confused account of the discoveries in ichthyology for the preceding 25 years, and copying the errors as well as the facts of his several authorities; it is valuable chiefly as a book of quotations, and as indicating to the student the original sources of information on his science; only about 780 undoubted species are described, and only 5 genera are added to the 61 of Linnaeus.—Comparative anatomy had made considerable progress toward the end of the 18th century, when Lacépède began his researches in 1798-1803; amid the terrors of the French revolution, shut off from communication with foreign ichthyologists, and deprived of new accessions from abroad, he was forced to work principally upon old materials without the opportunity to detect the errors of his predecessors. He divides the class into cartilaginous and osseous fishes, in each of which sub-classes he makes 4 divisions: 1, with neither opercula nor branchial membrane; 2, without opercula, and with a branchial membrane; 3, with opercula and without branchial membrane; and 4, with both opercula and branchial membrane. In each of the 8 divisions he adopts the orders of *apodes*, *jugulares*, *thoracici*, and *abdominales*, according to the absence of ventrals, or their position on the throat, thorax, or abdomen. The natural history of fishes in Sonnini's Buffon (1803-'4) is essentially a copy of Lacépède without acknowledgment. These works of Bloch and Lacépède supplied the principal foundation for most subsequent systems. The classification of M. Dumeril, in his *Zoologie analytique* (1806), resembles that of Lacépède, inasmuch as it lays stress upon the supposed absence

of opercula and branchial rays and the position of the ventral. In the cartilaginous fishes he makes the orders: 1, *trematopnés*, including the cyclostome and plagiostome families; 2, *chismopnés*, and 3, *eleutheropomes*, each with a single family; and 4, *telebranchies*, with 3 families. In the osseous fishes are ranked: 5, *holobranches*, with 23 families of the most common species; 6, *sternoptyges*, 7, *cryptobranches*, and 8, *ophichites*, each with a single family. He gives in all 212 genera. In 1810 Rafinesque published at Messina a list of Sicilian fishes arranged according to a natural order; the species are 390, of which about 180 are described as new; the system is essentially that of Lacépède, except that the cartilaginous are mixed in with osseous fishes, according to the opercular and branchial characters; he makes 71 orders, generally without regard to natural affinities, though some of the ideas are original and deserve attention. Pallas, in the 3d volume of the *Zoographia Russo-Asiatica* (1811), gives a list of 240 species, distributed into 38 genera, with the exception of 3 taken from Linnaeus; he makes 2 orders, *spiraculata* or chondropterygians, and *branchiata*, forming with reptiles (*pulmonata*) the class *monocardia* (single-hearted or cold-blooded animals). In 1815 Rafinesque published a 2d ichthyological system in his "Analysis of Nature, or Tableau of the Universe" (1 vol. 8vo., Palermo); on the principles of Lacépède he obtains the orders *deripia*, *thoraxipia*, *gastripia*, *apodia*, *eltropomia*, *chismopnea*, and *tremapnea*, subdivided into 30 families, each comprising 2 or 3 sub-families, and including in all 377 genera. Though containing many errors, this system is valuable for several true affinities between fishes before and since regarded as widely separated, as for instance that of the *polypterus* with the sturgeon family.—De Blainville in 1816 (*Journal de physique*, vol. lxxxiii.) published a classification in which fishes are divided into *gnathodontes* or osseous and *dermodontes* or cartilaginous, the latter distinguished by having teeth adherent only to the skin; the former include the *heterodermes* or *branchiostegi*, and the *squamodermes* or common fishes; in the subdivisions the Linnæan character of the position of the ventrals is adopted, and the families are established principally on the form of the body; it does not employ the Lacépèdean characters taken from the opercula and branchial rays.—Cuvier, in 1817, in his *Règne animal*, divides fishes into chondropterygians and osseous. The former contain the families of suckers (lampreys), selachians (sharks and rays), with fixed branchiæ, and the sturionians (sturgeons), with free branchiæ. In the osseous fishes he suppresses the *branchiostegi*, forming of a portion of them the order *plectognathi*, from a peculiar mode of articulation of the jaws, including the families gymnodonts, scleroderms, and lophobranches. The remaining osseous fishes he separates into the orders malacopterygians and acanthopterygians, after Artedi, according as the rays of the dorsal fin

are soft or spiny. The soft-rayed order he distributes into families, according to the Linnæan method of the position of the ventrals, disregarding entirely characters drawn from the opercula and branchial rays; in the abdominal fishes are the *salmones* (salmons), *clupes* (herrings), *esoces* (pikes), *cyprini* (carps), and *siluroides* (catfish); in the sub-brachians are the *gadoides* (cod), flatfishes, and *discoboli* (lump fishes); in the apodals are the *anguilliformes* (eel-like fishes). The spiny-rayed fishes form a single order, with the families tænioids (ribbon fishes), gobioids (blennies and gobies), labroids (bass), percoids (perches, a very extensive family), scomberoids (mackerel-like, also numerous), *squamipennæ* (chætodons, &c.), and the flutemouths (*fistularia*, &c.). He thus makes in all 22 families, founded on direct observation and comparison, and not simply compiled from previous authorities.—Goldfuss ("Manual of Zoology"), in 1820, adopted the 4 orders of Gmelin, giving to them Greek names, and subdividing them into 4 families, each according to the shape of the head, mouth, or body, or other external character. The abdominal fishes he calls *gasteropterygii*, with the families *leptocephala*, *rhynchocephala*, *aptocephala*, and *platycephala*; the apodals are styled *pteryopterygii*, with the families *ophioidei*, *enchelioides*, *xyphonoti*, and *macrorhynchi*; the *jugulares* and *thoracici* are united into the *sternopterygii*, with the families *orthosomata*, *tæniosomata*, *leptosomata*, and *cephalotes*; the *branchiostegi* and cartilaginous fishes form the *chondropterygii*, with the families *microstomata*, *cyclostomata*, *macrostomata*, and *plagiostomata*.—Risso (*Histoire naturelle de l'Europe méridionale*, vol iii., 1827) takes as the basis of his classification the *apodes*, *jugulares*, *thoracici*, and *abdominales* of Linnæus, adding the orders *plectognathes* and *lophobranches* of Cuvier, and making of the chondropterygians two orders according as the gills are fixed or free; the ordinary fishes he divides into malacopterygians and acanthopterygians.—Thus far the systems have been little more than repetitions of the combinations of Artedi, Linnæus, and Lacépède. Comparative and philosophical anatomy began to be studied with zeal from the beginning of the 19th century. Oken, Carus, Geoffroy St. Hilaire, Spix, Weber, Van der Hoeven, Meckel, Everard Home, Hunter, Tiedemann, and others, wrote upon different portions of the structure of fishes, and their results began to modify ichthyological classifications. Before mentioning the anatomical and embryological systems, the classification adopted in the *Histoire naturelle des Poissons*, by Ouvier and Valenciennes, beginning in 1828 and coming down to the present time, may be alluded to. In this, fishes are divided into osseous and cartilaginous, the latter (or chondropterygians) including the families sturionians, plagiostomes, and cyclostomes. The osseous fishes have the branchiæ pectinated or laminated, with the exception of the lophobranchs, which have them in the form of tufts: all the acanthopte-

rygians have the upper jaw free, including 13 families, and all the malacopterygians except the scleroderms, gymnodonts, and lophobranchs; the malacopterygians are divided into abdominals, sub-brachians, and apodes. Cuvier had very abundant materials at his command, embracing the collections of Péron, and those of the expeditions under Baudin, Freycinet, Duperrey, Dumont d'Urville, and other French naval officers.—Oken, in his "Physiophilosophy" (Ray society edition), calls the class *glossosozoa*, as those animals in which a true tongue makes its appearance for the first time, and *osteozoa*, because in them also the bony system first appears. He makes 4 divisions, the cartilaginous apodal and *jugulares*, *thoracici*, and *abdominales*, the first 2 having an irregular and the last 2 a regular body. Of the irregular fishes he makes 2 orders: I. The intestinal, protozooid fishes, with the mouth round and without maxillæ, or disproportionately narrow and wide, including the families: 1, infusorial fishes or lampreys; 2, polypary fishes (narrow-mouthed); and 3, aculephoid, or wide-mouthed (frog fishes). II. Vascular, conchozooid fishes, with: 4, mussel fishes (eels); 5, snail fishes (haddock); and 6, kraken fishes (gobies and *trigla*). In the regular fishes are 3 orders: III. Pulmonary or ancyliozooid fishes, with: 7, worm fishes (tunnies); 8, crustacean fishes (*labridæ*, &c.); and 9, ptilotooid fishes (perch). IV. Sarcose fishes, with: 10, typical fishes, or carps; 11, reptilian fishes (salmons); and 12, ornithic fishes (herrings and pikes). V. Sensorial fishes, with the last family: 13, thricozooid fishes (sharks, rays, sturgeons, &c.), the highest of the class.—Carus arranges fishes in his 3d circle, *cephalo-adoiozoa*, and in his 4th class, *cephalo-adoiozoa*; his orders are: 1, *cyclostomata*, related to *articulata*, as *petromyzon* and *myxine*; 2, *orthosomata apoda*, as *muraena*; 3, *orthosomata catapoda*, with the sub-orders *sternopterygii* (perch, cod, mackerel, &c.) and *gasteropterygii* (pike, salmon, herring, &c.); 4, *microstomata*, as *ostracion*, *diodon*, *pegasus*, *acipenser*; and 5, *plagiostomata*, related to reptiles, including the sharks and rays.—Among the systems based upon that of Cuvier are those of Bonaparte, Swainson, Straus-Durckheim, and Rymer Jones. The classification of C. L. Bonaparte (Rome, 1831) comprised the orders: 1, *acanthopterygii*, with 17 families; II, *malacopterygii*, with 12 families; III., *plectognathi*, with 2 families; and IV., *cartilaginei*, with 5 families; including in all nearly 3,600 species. The principal improvement on the system of Cuvier is in the series in which the genera are placed. Swainson ("Monocardian Animals," in Lardner's "Cyclopædia," 1838-'9), true to his quinary system, divides fishes into the 5 orders *acanthopterygæ*, *malacopterygæ*, *cartilagineæ*, *plectognathæ*, and *apodes*; the 1st and 2d typical forms, and the most highly organized, correspond in his circles to quadrupeds and birds, lizards and snakes, insessorial and rapacious birds, monkeys and carnivora respectively; the 3d, of large size, mostly viviparous,

and with a broad and depressed snout, represent reptiles, saurians, swimming birds, and cetaceans; the 4th, with small eyes situated far back, without true teeth or scales, with sharp jaws, and oval thick body armed with mail and semi-aquatic, he considers analogous to amphibians, chelonians, wading birds, and rodents; while the 5th, with the limbs smaller or absent and tail very long, correspond to fish, chameleons, rasorial birds, and hoofed quadrupeds in their respective circles. Straus-Durckheim (*Traité d'anatomie comparative*, Paris, 1843) adopts the 8 orders of Cuvier, but subdivides the chondropterygians with fixed branchiæ into 3 orders, and separates the sharks as the order *selaciens*, the rays as the order *batoïdes*, and the cyclostomes as the order *galaciens* (from Gr. γαλεος, lamprey), the term *cyclostoma* having been used for a gasteropod mollusk; he thus makes 10 orders. Rymer Jones (in the article "Pisces," in the "Cyclopædia of Anatomy and Physiology," 1847) adopts a modification of Cuvier's system. He makes 3 divisions: I., *chondropterygii* or cartilaginous fishes, with orders *plagiostomata* (with fixed branchiæ) and *sturionidæ* (with free branchiæ); II., *osteopterygii* or bony fishes, with orders *acanthopterygii*, *malacopterygii* *abdominales*, *M. subbrachiales*, *M. apodes*, *lophobranchii*, and *plectognathi*; III., *dermapterygii*, with skeleton cartilaginous or membranous, and with orders *cyclostomata* (lampreys) and *branchiostomata*.—About 1830 Prof. Agassiz, principally from the study of fossil fishes, established a classification based on the characters of the scales, as follows: order 1, placoids, corresponding to the cartilaginous fishes of authors, excluding, however, the sturgeons; 2, ganoids, including the sturgeons, and especially the fossil genera with enamelled scales; 3, ctenoids, comprising bony fishes with scales pectinated on the posterior border, and corresponding generally to the acanthopterygians of Artedi, exclusive of the scomberoids, labroids, and pleuronectes; 4, cycloids, including the malacopterygians with the above exceptions, and exclusive of the blennioids and lophioids. This system, now abandoned as an exclusive one by its author from its placing too much stress on external characters, was valuable as connecting in a continuous series living and fossil fishes, and led to the discovery of many important relations between the scales and the internal organs.—The system of Johannes Müller, as given in the Berlin "Transactions" for 1844, derives its characters from anatomical structure, leading often to combinations without regard to zoological differences. He makes 6 sub-classes: I., *dipnoi*; II., *teleostei*; III., *ganoidei*; IV., *elasmobranchii* or *selachii*; V., *marsipobranchii* or *cyclostomi*; VI., *leptocardi*. The first includes the order *sirenoidei*, with the family of the same name, embracing lepidosiren, &c. The 2d, including the osseous fishes generally, has the following orders: 1, *acanthopteri*, with 15 families, like perches, &c.; 2, *anacanthini*, with the sub-orders *sub-*

brachii (gadoids and flat fishes) and *apodes*, with family *ophidini*; 3, *pharyngognathi*, with the sub-orders of spiny-rayed (labroids and chromids) and soft-rayed *scomberesoces*; 4, *physostomi* with sub-orders *abdominales*, 11 families (silurids, salmon, herrings, &c.), and *apodes*, with 3 families of eel-like fishes; 5, *plectognathi*, with 3 families (ostracions, &c.); and 6, *lophobranchii*, with a family of the same name, including *hippocampus*, &c. The 3d sub-class has the orders: 1, *holostei*, with families *lepidostei* and *polypterinae*; and 2, *chondrostei*, with families *acipenserini* and *spatularie*. The 4th has the orders: 1, *plagiostomi*, with the sub-orders *squalidæ* or sharks, 10 families, and *rajidæ* or rays, 6 families; and 2, *holocephali*, with the family *chimæra*. The 5th comprises the orders: 1, *hyperoartii*, with family *petromyzonini*; and 2, *hyperotreti*, with family *myxinoidei*. The 6th and last sub-class includes the order *amphioxini*, with the family of that name. Siebold and Stannius adopt this classification in their "Comparative Anatomy;" and a slight modification of it may be found in the 3d volume of the "Organic Nature" in Orr's "Circle of Sciences," 1855. Owen's classification, mentioned below, and adopted by Sir John Richardson in the article "Ichthyology" of the "Encyclopædia Britannica," is based partly on that of Müller.—Vogt, in his *Zoologische Briefe* (1851), divides fishes into the orders *leptocardia*, *cyclostomata*, *selachia*, *ganoidea*, and *teleostia*. Van Beneden's embryological system is nearly the same, at the date of 1853; his orders are *plagiostomi*, *ganoidei*, *teleostei*, *cyclostomi*, and *leptocardii*. Van der Hoeven's classification, at about the same date (as given in the English translation of his "Handbook of Zoology," 1858), makes fishes the 14th class of the animal kingdom, and divides them into 5 sections, with 11 orders and 46 families. The sections are: I. *Dermopterygii*, with the orders: 1, *leptocardii*, and family *amphioxini*; 2, *cyclostomi*, with the myxinoid and petromyzont families. II. *Chondropterygii*, with orders: 3, *desmiobranchii* or plagiostomes (rays and sharks); 4, *eleutherobranchii*, with the chimæroid family. III. *Ganolepidoti*, with orders: 5, *chondrostei* (sturgeons), and 6, *ganolepidoti* (*lepidosteus* and extinct sauroids.) IV. *Osteopterygii*, with orders: 7, *lophobranchii*, and family of the same name; 8, *plectognathi*, with gymnodont and scleroderm families; 9, *malacopterygii*, with 16 soft-rayed families; and 10, *acanthopterygii*, with 18 spiny-rayed families. V. *Protopteri*, with order 11, containing the family *sirenoidei* (lepidosiren). Milne-Edwards, in his *Cours élémentaire d'histoire naturelle* (1855), divides fishes into osseous and cartilaginous; the former includes the orders *acanthopterygii*, *abdominales*, *subbrachii*, *apodes*, *lophobranchii*, and *plectognathi*; and the latter, the orders *sturiones*, *selachii*, and *cyclostomi*.—Owen's classification is as follows, taken from his "Lectures on Comparative Anatomy" (1855): order I., *dermopteri*, with the sub-orders *pharyngobran-*

chii (amphioxus), *marsipobranchii* or suckers (ammocetes, myxinoids, and petrolyzants), and *apodes lemniscati* or ribbon apodals; order II., *malacopteri*, with the sub-orders *apodes anguiformes* (eels, congers, &c.), *apodes arthropterygii* (*gymnotidae*), and *abdominales* (herring, salmon, cyprinodonts, pike, carp, siluroids, &c.); order III., *pharyngognathi*, with the sub-orders *malacopterygii* (*scomberesox*, *belone*, flying fish, &c.), and *acanthopterygii* (cyclo-labroids, &c.); order IV., *anacanthini*, with the sub-orders *apodes* (*ophidiidae*) and *thoracici* (cod, remora, and flounder); order V., *acanthopteri*, the most extensive of all, including the percoids, mullets, mailed-cheeks, sciaenoids, sparoids, labyrinthibranchs, scomberoids, dory, chaetodonts, gobioids, lophioids, &c.; order VI., *plectognathi* (*ostracion*, *diodon*, &c.); order VII., *lophobranchii* (*hippocampus* and pipe fish); order VIII., *ganoidi* (*lepidosteus*, *polypterus*, *amia*, and sturgeons); order IX., *protopteri* (*lepidosiren*); order X., *holocephali* (*chimæra*); and order XI., *plagiostomi* (sharks and rays).—The most recent classification is that published by Prof. Agassiz in his "Essay on Classification," p. 187 (1857), the result of the systems of Cuvier and Müller and of his own scale method, with additional light from his extensive anatomical and embryological researches. He divides the old class of fishes into four; his 1st and lowest class is myzonts, with 2 orders, myxinoids and cyclostomes; 2d, fishes proper, with 2 orders, ctenoids and cycloids; 3d, ganoids, with 3 orders, cœlacanth, acipenseroids, and sauroids, and doubtful, the siluroids, plectognaths, and lophobranchs; he was then doubtful whether this class should be separated from ordinary fishes; and 4th, selachians, with 3 orders, *chimæra*, *galeodes*, and *batides*. These classes he regards as equivalent to amphibians, reptiles, birds, and mammals. It is expected that the more mature results of his investigations on this class will soon be made public.—The following have been the principal cultivators of this science in America. Dr. Samuel L. Mitchell published in vol. i. of the "Transactions of the Literary and Philosophical Society of New York" (1815) a history of 149 species of New York fishes, with many illustrations; he adopts the Linnaean system; other descriptions of his species are in the "Proceedings of the Philadelphia Academy" and in the "Annals of the Lyceum of Natural History of New York." Lesueur has described and exactly figured many species in the Philadelphia academy's "Proceedings." Rafinesque published in the same work, and in his *Ichthyologia Ohiensis* (1820), descriptions of many species which had escaped his predecessors. Dr. Kirtland (1838) described the fishes of the Ohio river, and Dr. Holbrook several years after those of South Carolina; Dr. De Kay, in 1842, in his "Zoology of New York," divides fishes into bony and cartilaginous, the former having the sections: 1, *pectinibranchii*, with spiny-rayed and soft-rayed abdominal, sub-brachial, and apodal orders; 2, *lophobranchii*,

and 3, *plectognathi*; the latter include the sections *cleutheropomi*, *plagiostomi*, and *cyclostomi*. Dr. D. H. Storer, in his "Report on the Fishes of Massachusetts" (1839), and in the illustrated edition of the same in the "Memoirs of the American Academy" (1855-'60), and also in his "Synopsis of the Fishes of North America" ("Memoirs of the American Academy," vol. ii., 1846), follows the arrangement of Cuvier. These works are of great value to the student of North American ichthyology. The Wilkes, North Pacific, and Japan expeditions sent out by the U. S. government, and the various explorations by land for the survey of the Mexican boundary, the Pacific railroad route, and military and civil roads, have added largely to the materials, both foreign and native, at the disposition of American ichthyologists; these have been worked up principally by Messrs. Baird and Girard of the Smithsonian institution, where the collections are deposited. The results are published in the government reports on the naval expeditions, in vol. x. of the "Pacific Railroad Reports," in vol. ii. of the "Mexican Boundary Survey," and in the publications of the Philadelphia academy.—The disposition to make new genera and subdivide old ones is carried to a puzzling extreme in ichthyology as well as in other departments of zoology; and the prevalent system of placing the name of the genus-maker after the species, by whomsoever and whenever described, offers a premium for naturalists to make the greatest number possible of new genera, in their turn to be subverted or subdivided by the next author who examines the subject and who parades his name after the species. With the present confusion among zoologists in regard to generic characters, the prospect is that zoology will be overwhelmed with as many genera as there are species in the animal kingdom; and then, and not till then, may the names of the appended naturalists be considered as permanent. In getting rid of the too great condensation of Linnaeus, naturalists have fallen into the worse extreme of too extensive subdivision; and until some second Cuvier sets his face sternly against the present dilution of generic characters, we can expect nothing but utter confusion in our zoological classifications. The recent powerful re-statement of the Lamarekian hypothesis by Mr. Darwin in England, will probably put some check upon the creation of new species in all departments of zoology. For details on the structure and physiology of fishes, see FISHES.—ICHTHYOLOGY, FOSSIL. Fishes are by far the most numerous of the vertebrates found in the strata of the earth, extending from the silurian epoch to the tertiary; their number, excellent state of preservation, and remarkable forms, render fossil fishes of great interest in explaining the changes of our planet's surface, and in completing the chain of ichthyic relations. The classic work on fossil fishes is the *Recherches sur les poissons fossiles*, by Prof. Agassiz (1833-'43); in this magnificent work

about 1,000 species are described, with accurate and elegant illustrations, the result of his examinations of more than 20,000 specimens in the cabinets of Europe. He divides fossil fishes into the 4 orders of ganoids, placoids, ctenoids, and cycloids, according to the structure and form of the scales, these portions of the external skeleton being generally well preserved; the orders he divides into families according to the structure and position of the fins, the form of the bones of the head and of the teeth, and the structure of the gill covers and of the spinous fin rays. His classification is as follows. Order I., *ganoidæ*, characterized by osseous plates covered with enamel; the families are: 1, *lepidosteæ*, having no representative among existing fishes, such as *lepidotus*, *gyrolepis*, *osteolepis*, *paleoniscus*, &c.; 2, *sauroideæ*, like the existing *lepidosteus* and *polypterus*, and the extinct *diplopterus* and *megalichthys*; 3, *cælocanthi*, with hollow fin rays and bones, like *holoptychius* and *asterolepis*; 4, *pycnodontæ*, like *pycnodus* and *phylloodus*; 5, *sclerodermi*, like *ostracion* and *balistes* of the present day; 6, *acipenserideæ*, like sturgeons; 7, *gymnodontæ*, like the diodonts; 8, *lophobranchiati*, like the pipe fishes; and 8, *cephalaspideæ*, like *pterichthys*, *coccos-teus*, and *cephalaspis*. (See GANOIDS.) Order II., *placoidæ*, with tabular scales, like sharks and rays; including the *ichthyodorulithes*, such as *ctenacanthus* and *gyracanthus*; and the *plagiostomi*, with the families: 1, *cestraciodontæ*, such as *hybodus*, *ptychodus*, and *acrodus*, and the *cestracion Phillipsii* of Australia; 2, *squali*, or sharks, like many of the living genera; 3, *raja*, or rays; and 4, *chimæra*. Order III., *ctenoidæ*, having many living representatives, with scales serrated on their posterior margins, with the families *percoideæ*, *sparoideæ*, *scienoideæ*, *cottoideæ*, *gobioideæ*, *teuthys*, *aulostomata* (*fistularia*), *chatodontæ* or *squamiperna*, *pleuronectes*, and *mugilloideæ*. Order IV., *cycloideæ*, with elliptical or circular scales without serrations; in the spiny-rayed division he places the families *scomberoideæ*, *xiphoideæ*, *sphyranoideæ*, *blennioideæ*, *lophioideæ*, and *labroideæ*; in the soft-rayed division are the families *cyprinoideæ*, *cyprinodontæ*, *esocideæ*, *halcoideæ* (herring and salmon), and *anguilliformes*. The first order is most abundant from the old red sandstone to the chalk formation; the 2d extends from the silurian through the tertiary epochs; the last two are not found anterior to the chalk, from which they extend through the tertiary strata. For details on the most interesting fossil fishes, the reader is referred to the geological works of Hugh Miller.

ICHTHYOSAURUS (Gr. *ἰχθύς*, fish, and *σαῦρος*, lizard), a gigantic fossil marine reptile, belonging to the order enaliosaurians of Conybeare. The body was fish-like in form, with a large head, neck of equal width with occiput and thorax; the vertebræ had biconcave articular surfaces, as in fishes and the perennibranchiate reptiles; the paddles, 4 in number, were comparatively small, resembling in form those of cet-

ceans, but in the number of digits and of their constituent bones and appended bifurcated rays they came near the structure of the fins of fishes; the tail was long, the vertebræ gradually becoming smaller and flatter toward the end, and probably margined with a tegumentary fin expanded or in a vertical direction; the tail was doubtless the principal organ of locomotion, and presented the saurian character of length and gradual diminution, being cetacean in its partially tegumentary nature, and fish-like in its vertical position. According to Dr. Buckland, the skin was scaleless and finely wrinkled, as in cetaceans. The skull is like that of the dolphin, with a smaller cerebral cavity and an unanchylosed condition of the cranial bones; the intermaxillaries are greatly developed, and the orbits immense, surrounded by numerous large sclerotic plates; in the convex articulating surface of the occiput, the solid structure of the back part of the skull, and the massive proportions of the jaws and the bones with which they are articulated, we see crocodilian affinities. The nostrils are a short distance in front of the orbits; the teeth are situated in an alveolar groove, with their bases free, and separated by partial ridges, the roots being implanted much as in the crocodile; hence this reptile is placed by Prof. Agassiz in the order of rhizodonts. The structure of the hyoid apparatus indicates that it was an air breather, with a slightly developed tongue, and that it obtained its food in the water, having an apparatus, as in the crocodile, to shut off the cavity of the mouth from the larynx. The ribs are well developed, extending from near the head to the tail, and attached to a large sternum; the clavicles and shoulder blades are strong; the resulting pectoral arch resembles much that of the mammalian *ornithorhynchus*, and is very different from that of the cetaceans, indicating that the anterior limbs were used not only in swimming but in crawling up the shores of the ocean for the purpose of depositing their eggs, &c. The arm and forearm are very short and broad; after these come the bones of the wrist and fingers, arranged as flattened ossicles in series of from 3 to 6, so dovetailed together at the sides as to form one powerful framework. The pelvic arch is not articulated to the spine, but was merely suspended in the muscles, as in fishes; the posterior limbs or paddles are generally considerably smaller than the anterior, and would seem to have been more serviceable in terrestrial progression than in swimming. The best known species, *I. communis* (Conybeare), grew to a length of 20 feet; the large conical, longitudinally furrowed teeth are from 40 to 50 above on each side, and 25 to 30 below; the jaws are prolonged and compressed, the vertebræ about 140, with the anterior paddles 3 times as large as the posterior; like all the species, this is found in the secondary formations, principally in the lias and oolite of England. The *I. intermedius* (Conyb.), the most common and generally distributed of the species, does not

much exceed 7 feet in length; the teeth are more acutely conical, and about $\frac{40-49}{33-33}$; the vertebrae are about 130, and the fore paddles are much the largest. The *I. platyodon* (Conyb.), so called from the greater smoothness and flatness of the crowns of the teeth, must have attained a length of more than 30 feet; the head is longer than in the preceding species, and the jaws more broad and powerful; the teeth are about $\frac{44-48}{36-46}$, and are frequently found broken as if from its own violence; the vertebrae are about 120; the most remarkable character is the equality in size of the fore and hind paddles, and the comparative simplicity of their structure. The *I. lonchiodon* (Owen), with spear-shaped teeth, attained a length of more than 15 feet, with a very large head and more robust structure than even the last. The *I. tenuirostris* (Conyb.) is characterized by the length and slenderness of the jaws, as in the gavia; this, with the flat head and large orbits, gives to the skull, as Owen says, the appearance of that of a gigantic snipe with its bill armed with teeth; the teeth are slender and very numerous, about $\frac{70-70}{33-33}$, and directed obliquely backward; it attained a length of about 15 feet, and was rather slender in its proportions. Five other species, and details on all, will be found in Prof. Owen's "Report on British Fossil Reptiles to the British Association," in 1839. Their remains extend through the whole of the oolitic period, including the lias and oolite proper to the wealden and chalk formations, in Great Britain and central Europe. For fuller details the reader is referred to the writings of Conybeare, Cuvier, and Buckland. These reptiles, of gigantic size and marine in their habits, must have been very active and destructive; their food, as indicated by the bones and scales found with their remains, consisted principally of fishes. From the great size of the eyes, they could probably see well by night; being air breathers, like the crocodiles, they doubtless seized their prey near the surface rather than deep in the ocean; the immense cuttle fishes of the secondary epoch probably furnished a portion of their food. These strange creatures formed the connecting link between reptiles and fishes, as do the perennibranchiate amphibia in the actual creation; and by some they have been considered, like the last, as possessors of both gills and lungs, at least in some stage of their existence, and therefore to a certain extent amphibious. This reptile, with the muzzle of a dolphin, the teeth of a crocodile, the head of a lizard, the paddles of a whale, and the vertebrae of a fish, buried for myriads of years, was introduced to the scientific by Sir Everard Home, in the "Philosophical Transactions" for 1814.

ICOLMKILL. See IONA.

ICONIUM. See KONIEH.

ICONOCLASTS (Gr. *εικων*, an image, and *κλαω*, to break), in ecclesiastical history, the violent opponents of the veneration of images in the 8th and 9th centuries. The Byzantine

emperor Leo the Isaurian, prompted by the reproaches of Jews and Mohammedans who charged the Christians with idolatry, published an edict in 726 commanding all images of saints to be removed from the churches, and prohibiting honors to be paid to them. The image of Christ on the cross was excepted from this order. Leo was opposed by the Roman pontiff Gregory II., by a dangerous tumult in Constantinople, and by insurrections in Italy, and the result was a conflict of 120 years between the East and the West, which terminated in the defeat of the iconoclasts, though they were zealously supported by 6 Byzantine emperors. In 730 Leo caused the statues in churches to be burned and the paintings on the walls to be effaced. Pope Gregory III. assembled a synod at Rome which decreed the orthodoxy of the veneration of images (732). The successor of Leo, Constantine Copronymus, assembled a council at Constantinople (754), called by the Greeks the 7th general council, which after a deliberation of 6 months pronounced all visible symbols of Christ, except in the eucharist, to be either blasphemous or heretical, and the use of images in churches to be a revival of paganism. This decision was efficiently executed by Leo IV. (775-780), but the empress Irene, who succeeded him as regent for her son, successfully upheld the restoration of images. With the sanction of Pope Hadrian she assembled a council at Constantinople in 787, which was removed to Nice in Bithynia on account of a tumult of the iconoclasts, and which decreed that the cross, and the images of Christ, the Virgin, the angels, and the saints, were entitled to reverential worship (*τιμητικη προσκυνησις*), but not to divine worship (*λατρηα*). The contest was prolonged in the East under successive emperors, till Theodora assembled a council at Constantinople (842), which confirmed the decisions of the Nicene council, and established the veneration of images among the Greeks, though subsequently the Greek church took the position which it holds to this day that no carved, sculptured, or molten images of holy persons or things are allowable, but only pictures, which are held to be not images but representations. Rome and Italy had already accepted the decree of the Nicene council, which the Latin church accounts the 7th of the general councils.—The term iconoclasts is also applied in history to those Protestants of the Netherlands who at the commencement of the troubles in the reign of Philip II. tumultuously assembled and destroyed the images in many of the Roman Catholic churches. These tumults began Aug. 14, 1566, at St. Omer in the province of Flanders, where several churches were broken into and defaced, the images being overturned and broken and the pictures ruined. The insurgents next attacked the cathedral at Ypres, which they served in the same manner. The excitement speedily spread all over Flanders, and the churches, chapels, and convents of Valenciennes, Tournay,

Menin, Comines, and many other cities and towns, were assaulted and sacked. At Antwerp shortly afterward a mob ravaged the famous cathedral, destroyed the statues of Christ, the Virgin, and the saints, cut into pieces the paintings, the pride of Flemish art, that lined the walls, demolished the great organ, the largest and most perfect in the world, overthrew the 70 altars of the vast edifice, and carried off the garments and the gold and silver vessels used in the performance of the rites of worship. The devastation of the cathedral occupied them till midnight, when they left it with little more than bare walls standing, and sallied forth to deal in the same way with the other churches of the city and its suburbs. For 3 days these scenes continued at Antwerp, when they were stopped by a few knights of the golden fleece, who with their retainers attacked and dispersed the rioters. From Antwerp the excitement against images spread over the northern provinces, and throughout Holland, Utrecht, and Friesland the churches were ravaged. At Rotterdam, Dort, Haarlem, and some other places, the magistrates averted the storm by quietly removing the images from the buildings. "The amount of injury inflicted during this dismal period," says Prescott, "it is not possible to estimate. Four hundred churches were sacked by the insurgents in Flanders alone. The damage to the cathedral of Antwerp, including its precious contents, was said to amount to not less than 400,000 ducats. The loss occasioned by the plunder of gold and silver plate might be computed; the structures so cruelly defaced might be repaired by the skill of the architect; but who can estimate the irreparable loss occasioned by the destruction of manuscripts, statuary, and paintings? It is a melancholy fact, that the earliest efforts of the reformers were everywhere directed against those monuments of genius which had been created and cherished by the generous patronage of Catholicism." Motley, in his "History of the Rise of the Dutch Republic," maintains that the iconoclasts committed no act of plunder nor of outrage on persons. He says: "Catholic and Protestant writers agree that no deeds of violence were committed against man or woman. It would be also very easy to accumulate a vast weight of testimony as to their forbearance from robbery. They destroyed for destruction's sake, not for purposes of plunder. Although belonging to the lowest classes of society, they left heaps of jewelry, of gold and silver plate, of costly embroidery, lying unheeded upon the ground. They felt instinctively that a great passion would be contaminated by admixture with paltry motives. In Flanders a company of rioters hanged one of their own number for stealing articles to the value of 5 shillings. In Valenciennes the iconoclasts were offered large sums if they would refrain from desecrating the churches of that city, but they rejected the proposal with disdain. The honest Catholic burgher who recorded the fact, observed that he did so because of the

many misrepresentations on the subject, not because he wished to flatter heresy and rebellion." The whole time occupied by this remarkable outbreak was less than a fortnight. It was warmly disapproved of at the time by William of Orange, Egmont, and the other statesmen of the patriotic party in the Netherlands. Its immediate effect was to detach the Catholics from the national cause, and it probably was the principal means of preventing the southern provinces of the Netherlands from becoming independent of Spain in concert with the 7 northern provinces.

ICTINUS, a Greek architect, contemporary with Pericles. He was chief architect of the Parthenon, and built the temple of Apollo Epicurius near Phigalia in Arcadia. The former was completed in 438 B. C., and the latter probably about 431. He also built the fane at Eleusis in which the mysteries in honor of Ceres were celebrated. All these edifices were in the Doric style. No details relative to the life of Ictinus have come down to us.

IDA, a W. N. W. co. of Iowa, drained by branches of Little Sioux river; area, about 400 sq. m.; pop. in 1859, 38. It has but recently been organized. Grain, potatoes, and sorghum are the principal crops; cattle raising is also carried on to a considerable extent. The productions in 1859 were 813 bushels of wheat, 11,452 of Indian corn, 5,791 of potatoes, 1,721 of oats, 7,862 lbs. of butter, and 820 gallons of molasses. Capital, New Ida.

IDA. I. A mountain range (now Kas-dagh) of Phrygia, forming the S. boundary of the Troad. Its highest peak was Mt. Gargarus, about 4,650 feet above the sea. The principal rivers flowing from Mt. Ida were the Sinois, Scamander, and Granicus. From Mt. Ida Gany-mede was stolen; here Paris pronounced judgment on the beauty of the rival goddesses; and here the celestials stationed themselves to behold the battles for Troy on the plain below. II. A mountain (now Psiloriti) of Crete, and the loftiest of the range which traverses that island, of which it occupies the centre, terminating in 3 peaks crowned with snow for 8 months of the year. Its highest summit is said to be over 7,500 feet. Of the legends with which its name is connected, those relating to the infancy of Zeus are the most celebrated.

IDELER, CHRISTIAN LUDWIG, a German savant, born in Gross-Brese, near Perleberg, Sept. 21, 1766, died Aug. 10, 1846. His earliest work was the editing in 1794 of an astronomical almanac for the Prussian government. For several years he taught mathematics and mechanics in the school of woods and forests, and also in the military school, and in 1821 became professor in the university of Berlin. His principal works are: *Historische Untersuchungen über die astronomischen Beobachtungen der Alten* (Leipsic, 1806); *Handbuch der mathematischen und technischen Chronologie* (Berlin, 1825-'6), "the first work which ever gave the world a clear view of the computation of time

by ancients and moderns;" and *Die Zeitrechnung der Chinesen* (Berlin, 1839). His manuals of the French and English languages and literatures were at one time very popular.

IDES, in the Roman calendar, the 15th day of March, May, July, and October, and the 13th day of the other months. The 8 days preceding the ides were named from it, and styled the 1st, 2d, 3d, &c., day before the ides. Under the empire the senate sat regularly on the ides and on the calends, with the exception of the ides of March, the anniversary of Cæsar's death, which was regarded as a *dies ater*.

IDIOCY, or IDIOTY, a term now used to express a condition of mental imbecility, though this idea was not originally contained in the root from which it is derived. The idiot (*ιδιωτης*) among the Greeks was primarily the private individual, in distinction from the man who participated in public affairs; next, as the educated classes, especially in Sparta, where the word is believed to have originated, alone took part in public life, *ιδιωτης* came to mean an ignorant or unlettered man; and finally, as ignorance tended to mental degradation, it was applied to one who did not possess the capacity to learn. Numerous attempts have been made to define idiocy, but none of them have been perfectly satisfactory. Most psychologists at the present day regard it as an arrest of mental development, either from congenital defect or disease occurring subsequent to birth, in which the will has but partial control over the muscular system, and external impressions are not readily communicated to the mind. Dr. E. Séguin, perhaps the most philosophical author who has yet written upon the subject, considers idiocy as a prolonged infancy, in which, the infantile grace and intelligence having passed away, the feeble muscular development and mental weakness of that earliest stage of growth alone remain. Dr. Sägent of Berlin, a high authority on the subject, on the other hand, regards it as depending upon a faulty organization of the brain. Psychologists have agreed upon the following classification of the different forms of idiocy: 1, idiocy proper, divided into congenital idiocy, and that which is the result of disease occurring in childhood; 2, cretinism; 3, imperfect and irregular development, as manifested in the case of persons who possess some faculties in their full power, while others are deficient. Some writers also add moral idiocy, or arrested development of the moral sense, while the physical and intellectual powers are not deficient; but the propriety of this addition is not fully settled. Fatuity, or the mental blight resulting from disease or disorganization of the brain in adults, though resembling idiocy in its apparent results, is to be distinguished from it; it is a disease incapable of any amelioration.—Idiocy has existed in all ages and countries. There is no language, either of Europe or Asia, which has not among its earliest words one or more expressive of this mental condition. The Justinian code regarded idiots

as incapable of holding property; and by the codes of Europe at the present day they are, if they inherit property and their parents are dead, placed under strict guardianship. The causes assigned for idiocy are numerous, and not all of them well ascertained. Intermarriage of near relatives, intemperance in eating or drinking, and especially sexual congress leading to conception while one or both parties are intoxicated, excess of sexual indulgence or solitary vice, grief, fright, or sudden and alarming sickness on the part of the mother during gestation, the habitual use of water impregnated with magnesian salts, bad and insufficient food, impure air, hereditary insanity, and scrofulous or syphilitic taint, are the most commonly alleged causes of congenital idiocy. Convulsions, epileptic fits, hydrocephalus, and other diseases of the brain, small pox, scarlatina, and measles, blows on the head, or the translation of scrofulous or other eruptive diseases to the brain, are the usual influences which arrest mental development in children. The causes of cretinism have been stated under that head.—No attempt is known to have been made to improve the condition of idiots till the 17th century. When St. Vincent de Paul took charge of the priory of St. Lazarus, he gathered a few idiots, and, fitting up a room in the priory for their accommodation, took charge of them in person, and attempted to instruct them. His labors, though continued for many years, seem not to have been very successful. The next effort was made by the eminent philosopher and surgeon Itard, the friend and disciple of Condillac. In 1801 a wild boy was found in the forests of Aveyron, and brought to Itard, who hoped to find in his instruction the means of verifying the philosophical theories of his master, and labored patiently for 6 years to develop his intellectual faculties by means of sensations. The young savage proved to be an idiot of low grade, and hence unfit for the experiment; but the attempt to instruct him had satisfied Itard that it was possible to elevate the mental condition of idiots. His immense practice, and the severe suffering induced by the malady which finally caused his death, prevented him from devoting much time to the subject; but he had gathered many facts, and these he committed to his pupil, Dr. Edward Séguin, who entered upon the work as a labor of love, and devoted several years to a thorough research into the causes and philosophy of idiocy, and the best methods of treating it. Meantime others had become interested in the subject. In 1818, and for several years subsequently, the effort was made to instruct idiot children at the American asylum for the deaf and dumb in Hartford, Conn.; the measure of success was not large, but their physical condition was improved, and some of them were taught to converse in the sign language. In 1819 Dr. Richard Pool of Edinburgh, in an essay on education, advocated the establishment of an institution for imbeciles. In 1824 Dr. Bel-

homme of Paris published an essay on the possibility of improving the condition of idiots; and in 1828 a few were instructed for a short time at the Bicêtre, one of the large insane hospitals of Paris. In 1831 M. Falret attempted the same work at the Salpêtrière, another hospital for the insane in the same city. Neither of these efforts met with sufficient success to be continued. In 1833 Dr. Voisin, a French physiologist and phrenologist, organized a school for idiots in Paris, but it was not of long duration. In 1839, with the aid of Dr. Leuret, at that time one of the physicians of the Bicêtre, he revived the school for idiots in that hospital, and subsequently placed it under the charge of M. Vallée. In 1838 Dr. Séguin opened a school for idiots in Paris, and was soon so successful that the school in the Bicêtre was placed under his charge; and within 3 years he received from the French academy, whose committee had carefully tested his system of instruction, a testimonial of their approval. The previous efforts for the instruction of idiots had been made with no definite ideas of their psychological condition, but in the vain hope that, somehow, knowledge might be imparted to them. We have seen that these efforts failed, or rather they were only successful in improving to some slight extent the personal habits of the idiots, and teaching them to do a few things by rote. Dr. Séguin proceeded on an entirely different plan; starting with the postulate that idiocy is only a prolonged infancy, he consulted nature as to the mode by which the physical powers are cultivated and the mind educated in the infant. He found in idiot children the infantile fondness for bright colors, and availed himself of it to teach them the distinctions of color and form; he noticed their liking for playthings, and furnished them with builders' blocks, cups and balls, and other toys, by which he could instruct them in number, form, and size; he next taught them words, not letters (these came later), and the meaning of words by pictures; the refractory organs of speech, not yet fully under the control of the will, were moulded and manipulated, until they could utter the sounds he desired; the eye, the foot, the hand, were educated by the use of steps, dumb bells, and other gymnastic exercises; as fast as they could comprehend them, ideas—at first only concrete, but afterward, as they attained to higher consciousness, those of an abstract character—were instilled into their minds. The moral nature was cultivated at times by simple instruction, but oftener by a pure example. The process was long, but in the end it triumphed. Dr. Séguin continued the instruction of idiots in Paris till 1848, a part of the time in a private establishment, and in 1846 published his treatise on the treatment of idiocy, which placed him at once in the front rank of living psychologists. In 1848 he visited the United States, and assisted in the organization and improvement of several institutions for idiot instruction; and since 1856 he has resided in Ohio. Two years before Sé-

guin commenced his school for idiots in Paris, Dr. Guggenbühl began his experiments in regard to the treatment of cretins in Switzerland, already detailed under GUGGENBUHL and CRETINISM; and 4 years later, Säget, a teacher of deaf mutes at Berlin, began to receive idiotic pupils, and devoted himself to the study of medicine in order the better to understand their physiological condition. We have already alluded to the difference between his views of the pathology of idiocy and those of Dr. Séguin. He relies to some extent upon medication in the treatment of idiotic children; and as many of those under his charge have some taint of cretinism, it is possible that it may be required there. In the methods of instruction he does not, so far as we can learn, differ materially from Séguin. In 1846 the results said to have followed Dr. Guggenbühl's labors on the Abendberg, the success of Dr. Séguin, and of M. Vallée, who had adopted his plans at Paris, and the publication of Dr. Séguin's work, roused some of the English philanthropists to attempt the instruction of idiots in that country. The first schools in England were small, and were sustained by some benevolent ladies, in the towns of Lancaster, Bath, Ipswich, and Brighton. In 1847 an effort was made to establish an institution in some degree commensurate with the wants of the class for whom it was intended. In this movement Dr. John Conolly, the Rev. Dr. Andrew Reed, the Rev. Edwin Sidney, and Sir S. Morton Peto distinguished themselves by their zeal and liberality. They first rented extensive buildings, formerly the residence of a nobleman, at Highgate, near London, and a railway hotel at Colchester, for the accommodation of idiotic pupils, and then, by great exertion, secured a sufficient subscription to enable them to erect an asylum with 400 beds for a permanent institution. This edifice, known as the royal idiot asylum, at Earlswood, Surrey, was completed in 1856, at a cost, including fixtures, of nearly \$375,000. Their funds do not allow them to receive the full number they can accommodate. The establishment at Colchester, now known as Essex hall, is still maintained as a distinct institution, though under the same management. There are two idiot asylums in Scotland: one at Baldoran, near Dundee, on the estate of Sir John Ogilvie, founded in 1853, and supported by Sir John and Lady Ogilvie; the other at Edinburgh, founded in 1855 by Drs. Coldstream and J. Smith, and now under the charge of Dr. David Brodie. At the Hanwell insane asylum, England, there is a department for adult idiots, but they receive no instruction.—In the United States, the movement for the instruction of idiots commenced almost simultaneously in New York and Massachusetts. There had been efforts made, in isolated cases (apart from the attempts at the American asylum already referred to), to instruct idiot children, in the Perkins institution for the blind in Boston, and in the New York deaf and dumb institution, as early as 1838 or 1839; but the feasibility of

organizing an institution for their treatment and training does not seem to have been thought of, till the attention of philanthropists was drawn to it by the eloquent letters of Mr. George Sumner, describing his visits to the schools of M. Vallée and Dr. Séguin in Paris. These letters were published in 1845, and Dr. S. B. Woodward, long known as the superintendent of the hospital for the insane at Worcester, Mass., and Dr. Frederic F. Backus of Rochester, N. Y., soon after corresponded upon the subject. Dr. Backus was elected a member of the N. Y. state senate in the autumn of 1845, and in Jan. 1846, read a report which he had drawn up on the subject of idiot instruction, and the necessity of an institution for the purpose. A few weeks later he reported a bill for such an institution. During the same month a bill passed the Massachusetts legislature, appointing a commission to investigate the condition of the idiots of Massachusetts, and report on the necessity of measures for their instruction. The result was the establishment of an experimental school in Oct. 1848, and subsequently, in 1851, of a permanent institution under the name of the "Massachusetts school for idiotic and feeble-minded youth." Meantime, Dr. Hervey B. Wilbur, a young physician of Barre, Mass., had opened a school for idiot children in Barre, in July, 1848. In 1851 the institution whose organization Dr. Backus had sought in 1846, but which by adverse influences had been delayed, was finally established, first as an experimental school at Albany, and subsequently as a permanent state asylum at Syracuse. The state in 1855 erected a fine edifice for it at Syracuse, at a cost of between \$80,000 and \$90,000, with accommodations for 150 pupils. It has been from the first under the charge of Dr. Wilbur, who was called from Barre to organize the experimental school. It is now full. In 1852 a "training school for idiots" was established at Germantown, Penn., which received aid from the state. In 1857, having received a grant from the state, and liberal subscriptions from individuals, its trustees purchased a tract of land at Media, Penn., about 20 m. from Philadelphia, and commenced the erection of a building for a state asylum, which they now occupy. This institution is under the care of Dr. Parish. The legislature of Ohio in 1857 organized an experimental school, with a view to the establishment of a permanent institution for idiots, at Columbus, under the care of Dr. R. J. Patterson. There are also 3 private schools for idiots and imbeciles in the United States, viz: the original school at Barre, Mass., founded by Dr. Wilbur, and since 1851 under the care of Dr. George Brown; a school for idiot children at Harlem, N. Y., under the charge of Mr. J. B. Richards, formerly superintendent of the Pennsylvania training school; and a school for idiotic and feeble-minded children at Lakeville, Litchfield co., Conn., under the care of Dr. H. M. Knight.—The American schools have generally adopted Dr. Séguin's methods of instruc-

tion, with some modifications. The gymnasium is relied upon for developing the physical system, and rousing and fixing the attention. The rudiments of arithmetic are taught, and a considerable number of the pupils are able to add, subtract, multiply, and divide, in numbers below 100; but, in most cases, they grasp the idea of numbers with great difficulty. In geography they make more progress. In penmanship and drawing many of them are very expert, and most of the girls and some of the boys exhibit considerable skill in needle-work. One boy at Syracuse has invented a machine for which a patent has been secured. In moral training they have generally exhibited a remarkable susceptibility for improvement. The American schools do not for the most part receive children above 16 years of age, and prefer those not over 12, as those who are older have become so fixed in awkward and sometimes vicious habits, that it is extremely difficult to overcome them. In the royal institution at Earlswood, England, on the contrary, pupils are taken at all ages, some even 30 years old, or more; they receive very little intellectual instruction, but are taught to sew, knit, make mats, shoes, &c., and enjoy careful religious training. A large proportion of the pupils in this institution are not truly idiots, but feeble-minded persons, and of slow and imperfect development. The continental schools are mostly small; and while some of them, as for instance those at Berlin, Winterbach, Gohlis, Bendorf, and the Hague, are conducted with much ability, others have fallen into the practice of teaching the children to repeat a few things by rote, and pay small regard to awakening independent thought.—It is estimated that of idiots not affected by epilepsy, who are brought under instruction in childhood, from $\frac{1}{3}$ to $\frac{1}{2}$ may be made capable of performing the ordinary duties of life with tolerable ability. They may learn to read and write, to understand the elementary facts of geography, history, and arithmetic, to labor in the mechanic arts under proper supervision, and to attain sufficient knowledge of government and morals to fulfil many of the duties of a citizen. A larger class, probably $\frac{1}{2}$ of the whole, will become cleanly, quiet, able perhaps to read and write imperfectly, and to perform under the direction of others many kinds of work requiring little thought. This class, if neglected after leaving school, will be likely to relapse into many of their early habits. A small number, perhaps the most promising at entering, will make little or no progress. Nor can the result in any particular case be predicted beforehand, and no methods of instruction yet adopted will invariably develop the slumbering intellect, and confirm and correct the enfeebled or depraved will.—In the following table we present a view, necessarily imperfect, but derived from the latest sources, of the schools for idiot instruction in Europe and the United States. The number of pupils is rather the average than the exact number attending at any one date..

Place and name.	Superintendents.	Open- ed.	No. of pupils.	Remarks.
UNITED STATES:				
Barre, Mass., school for children of backward and imperfect development.....	Dr. George Brown	1848	50	Private.
South Boston, Massachusetts school for idiotic and feeble-minded youth.....	Dr. S. G. Howe and Mr. Alex. McDonald	1848	50	Partly supported by the state.
Syracuse, N. Y., state asylum for idiots.....	Dr. H. B. Wilbur.....	1851	150	Supported by the state.
Harlem, N. Y.....	Mr. J. B. Richards	1856	12	Private.
Media, Penn., state training school.....	Dr. J. Parish.....	1852	40	Partly supported by the state.
Columbus, O., experimental school.....	Dr. R. J. Patterson.....	1857	15	Supported by the state.
Lakeville, Litchfield co., Conn.....	Dr. H. M. Knight	1858	12	Private.
ENGLAND:				
Earlswood, near Surrey, royal institution for idiots.....	Dr. Down	1855	286	Subscribers.
Colchester, Essex hall.....	.....	1847	.....	Subscribers. Same management as preceding.
Bath .....	.....	1846	.....	Private.
Ipswich .....	.....	1847	.....	"
SCOTLAND:				
Baldoran, near Dundee .....	.....	1853	20	On the estate of and supported by Sir John and Lady Ogilvie.
" Edinburgh.....	Dr. David Brodie	1855	30	Subscribers.
FRANCE:				
Paris, Bicêtre	Dr. Delasiauve.....	1828	.....	Mostly adult idiots.
" Salpêtrière .....	.....	1833	.....	Mostly adults.
" La Force, Dordogne	Pastor Bost.....	1855	.....
DENMARK:				
Copenhagen	Dr. Hubertz	1850	.....
"	Mr. John Moldenhauer.....	1851	.....	Supported by government.
SCHLESWIG-HOLSTEIN:				
Altona	Dr. Hansen.....	1850	.....
SWITZERLAND:				
The Abendberg, above Interlachen.....	Dr. Guggenbühl.....	1838	40	Cretins.
Basel	Dr. Pöpple.....	1858	.....	For infant idiots.
PRUSSIA:				
Berlin.....	Dr. Sägemann.....	1840	45	Private.
Bendorf, near Coblenz	Dr. Erleumayer.....	1848	50	
SAXONY:				
Gohlis, near Leipzig	Dr. Ferd. Kern	1846	.....
Hubertsburg, near Dresden	Dr. Glasche.....	1846	30	
WÜRTTEMBERG:				
Winterbach	Dr. Müller.....	1850	66	
Mariaberg	Dr. Zimmer.....	1850	70	
BAVARIA:				
Exberg.....	Pastor Frobst.....	1854	.....
HOLLAND:				
The Hague .....	.....	1856	22	
SARDINIA:				
Vale of Aosta .....	.....	1844	.....	Cretins.
Turin .....	.....	1852	.....	Idiots.

—The number of idiots and their proportion to the population cannot be ascertained with any satisfactory degree of accuracy. No census statistics are to be trusted; in a district where one census taker would report none, another might find 20. It is very difficult to persuade parents, from whom the returns are usually obtained, that their children are idiots. Some of the worst cases in idiot asylums were brought there by their friends, not as idiots, but as being a little peculiar in their habits. The effort has been made in Massachusetts, Connecticut, and Ohio, to obtain returns from physicians, clergymen, and town officers, but with very moderate success. So far as these returns go, however, they show a much greater prevalence of idiocy than is generally supposed. Taking returns received from towns in different sections of these states, and averaging the results, we think it is considerably within the truth to estimate that 6 persons in every 1,000 are either idiots, or of such imperfect mental development as to be of little or no service to the community. In some portions of Great Britain, as for instance Lancashire in England, or the highlands of Scotland, the proportion is considerably larger than this; and in the mountainous districts of the continent, where cretinism abounds, it ranges from 3 to 10 per cent. of the population.—The enthusiasm of philanthropists has led to the expectation of higher results from the training and instruction of idiots than have yet been or are likely to be realized. A very considerable proportion of those under instruction will make little or no intellectual progress; the mind is too thickly

shrouded for the light to reach it. The condition of others, and especially those suffering from epilepsy, a very frequent concomitant of idiocy, is still more hopeless. The training school may slightly improve their physical condition, but that is all. There is however a large number, and those often apparently the worst cases when admitted, who will attain to a considerable degree of intelligence under judicious instruction, and will develop sufficient ability to be capable, under the direction of others, of acquiring a livelihood.—The following works on idiocy may be consulted: Dr. Richard Poole, "Essay on Education" (first published in the "Edinburgh Encyclopædia," 1819, afterward in a separate volume, 1825); Dr. Niepce, "Goitre and Cretinism" (Paris, 1845); Dr. E. Séguin, *Traitement moral, &c., des idiots* (Paris, 1846); "Reports of the Royal Institution for Idiots" (London, 1847-'60); "Reports of Commissioners on Idiocy in Massachusetts" (Boston, 1848-'9); Dr. Louis Guggenbühl, "Cretinism and its Treatment" (Bern, 1848); "Reports of the Massachusetts School for Idiotic and Feeble-Minded Youth" (1848-'60); "Report of the Commissioners created by the King of Sardinia for the Study of Cretinism" (Turin, 1850); Dr. Stolst, "Researches on Idiocy and Cretinism in Norway" (Christiania, 1851); M. Hubertz, "Statistical Studies on Idiocy" (Copenhagen, 1851); Dr. Stark, "Mental Alienation and Idiocy in England, Scotland, and Ireland," 14th volume of statistical society's "Journal" (1851); "Reports of the New York State Asylum for Idiots" (1851-'60); Dr. Coldstream, "Essay on Idio-

cy" (Edinburgh, 1852); Dr. Eschricht, "On the Possibility of Educating Idiotic Children to become Useful Members of Society" (Copenhagen, 1854); Rev. Edwin Sidney, "Idiot Training, a Lecture" (London, 1855); Dr. W. Blackie, "Cretinism and Idioey" (Edinburgh, 1855); "Report of Commissioners on Idioey in Connecticut" (New Haven, 1856); Dr. L. P. Brockett, "Idiots and the Efforts for their Improvement" (Hartford, 1856); Dr. Ferd. Kern, "Essay on Idiot Instruction" in *Allgemeine Zeitschrift für Psychiatrie* (1857); James Abbot, "Handbook of Idioey" (London, 1857).

IDOCRASE, a mineral species of the garnet section of the silicates, named from Gr. *ιδωα*, to see, and *κρασις*, mixture, indicating resemblance to other species in its crystalline forms. It occurs variously colored, as brown, sulphur yellow, green, and blue; and of vitreous, frequently somewhat resinous lustre. Its hardness is 6.5; specific gravity, 3.35-3.45. It was first observed in the lavas of Vesuvius, and was called Vesuvian. Numerous localities of it are known in gneiss rocks, serpentine and granular limestone. It is particularly abundant at Parsonsfield and Phippsburg, Me., occurring in massive forms as well as in crystals.

IDRIA, a mining town of the circle of Adelsberg, duchy of Carniola, in Austrian Illyria, 32 m. N. N. E. from Trieste, and 35 m. W. S. W. from Laybach; pop. 4,400. The town is situated in a deep, narrow Alpine valley, on a small river of the same name. Its quicksilver mines are the second in importance in Europe, and now produce annually about 3,000 cwt., beside about 650 cwt. of artificial cinnabar. The rich hepatic mercurial ore is found in a formation of clay slate forming a bed in compact limestone. The excavations are horizontal galleries diverging from a shaft which has been sunk to a depth of more than 1,000 feet. The entrance is from the *Schloss*, a building within the town. Descent is accomplished partly by some 800 steps cut in the rock, and partly by ladders. The miners are a uniformed corps, 500 in number, and the service is eagerly sought for, the higher rate of wages and contingent advantages being balanced against the unhealthiness of the occupation. The mines were discovered in 1497, and are the property of the crown. Amsterdam was formerly the chief market for the quicksilver, for South American account, but it is now sent to Vienna for use in the gold and silver mines of Hungary and Transylvania.

IDUMÆA (the Greek form of the Semitic name Edom), the country around Mt. Seir, extending N. and E. from Mt. Horeb to the southern border of Canaan. Its more ancient name was Seir, which it derived from a patriarch of its early inhabitants, the Horims (Dent. ii. 12, 22). It was peopled by the descendants of Esau, and was added to the Israelitish monarchy by David. The Edomites recovered their independence during the reign of Joram over Judah, and avenged themselves on the Jews by their cruelties at the capture of Jerusalem by

Nebuchadnezzar. They were able to extend their power as far north as Hebron, while their ancient seats were invaded and occupied by the Nabathæan Arabs. The Idumæa of Roman and the later Jewish writers, therefore, embraces parts of southern Palestine and northern Arabia Petræa. The Maccabees subjected the Idumæans, and an Idumæan dynasty was subsequently established on the Jewish throne. (See HEROD.) In the Augustan age, Idumæa and Judæa were often used indiscriminately by Roman writers, but the former disappears from history after the destruction of Jerusalem.

IFFLAND, AUGUST WILHELM, a German actor and dramatist, born in Hanover, April 19, 1759, died in Berlin, Sept. 22, 1814. At the age of 18 he eloped from home and made his début upon the stage at Gotha, in one of Engel's comedies, in which he took the part of an old Jew. In 1779 he joined the theatrical company at Mannheim, and was the leading actor in this city when in the latter part of 1781 Schiller put into his hands the manuscript of the "Robbers." The play was produced in the succeeding January, with Iffland in the part of Franz Moor, and the success which attended the representation at once brought Schiller into notice, and confirmed the rising reputation of Iffland. The latter remained in Mannheim until 1796, when he was invited to Berlin to assume the direction of the national theatre of that city. In 1811 he was appointed general director of all the royal plays, and about the same time made an extended professional tour through Germany. From the commencement of his career Iffland cultivated dramatic composition, and in time became not less celebrated as a playwright than as an actor. His plays, chiefly of the class known as the domestic drama, were very successful in their day, and are still occasionally performed on the German stage; but the vein of lachrymose sentiment which pervades them is less palatable to the present than to former generations. Among the best of his works are *Die Jäger*, *Der Spieler*, *Die Hagestolzen*, &c. A collection of 47 of them was published in 16 vols. in Leipsic in 1798-1802, including a memoir of his theatrical career. Subsequent volumes containing other pieces were published in 1807-'9 and in 1827; and in 1844 his select works appeared.

IGLAU, a town of Moravia, Austria, on the right bank of the Iglawa, 49 m. W. N. W. from Brünn; pop. about 14,000. It consists of the town proper, which is walled, and 3 suburbs, and contains a military school.

IGNATIUS, SAINT, surnamed Theophorus, one of the primitive fathers of the church, lived in the latter part of the 1st and early part of the 2d century. He was a native of Syria or Asia Minor, and succeeded Evodius as bishop of Antioch about A. D. 69. Ignatius was a contemporary of the apostles, and, according to Theodoret, was consecrated by St. Peter himself. He had been a hearer, and was probably a convert of the apostle John. On the outbreak

of the persecution under Trajan, he was brought before that emperor at Antioch, and, after examination, was condemned to be taken to Rome and there thrown to wild beasts. This sentence was carried into execution, Dec. 20, 107, or 116. His remains are said to have been collected by the faithful and reconveyed to Antioch, where they were interred. During the journey of Ignatius to Rome, he addressed various epistles to the churches of Asia and to individuals, and one to the Christians of the city whither he was going to be martyred. Fifteen of these letters have come down to us, but in so corrupt a state that many critics have pronounced the greater number of them spurious. The best edition of the epistles ascribed to Ignatius is that of Cotelierus (Amsterdam, 1724). There are two English translations of them, one by Archbishop Wake, the other by Cureton.

IGNATIUS, SAINT, patriarch of Constantinople, born in 798, died Oct. 23, 878. He was the youngest son of the emperor Michael I., and his original name was Nicetas; but on the deposition of his father by Leo the Armenian, he was made a eunuch by Leo and entered a monastery, assuming the name of Ignatius. He was raised to the patriarchate in 846. He was an enemy of the iconoclasts, and would not suffer Gregorius Asbestos, bishop of Syraense, to be present at his consecration, because of his heterodoxy. Having in 857 refused to admit Bardas, brother of the empress Theodora, as a communicant, on account of the reported immorality of his life, the offender caused him to be deposed, and Photius to be elected patriarch in his place. After his deposition he was treated with the greatest cruelty, and banished to Mytilene; but when Basil the Macedonian ascended the throne in 867, he was recalled from exile.

IGNIS FATUUS, a flickering light seen at night over the surface of marshy grounds or graveyards. Sometimes it moves quietly along, resembling the light of a lantern carried in the hand; and again it appears not alone, but two or three together dancing merrily up and down. In the night mists it seems like the light from some neighboring house; and many a traveller has been enticed by its false promise, and led into dangerous bogs, from which he found no escape till the appearance of the morning light. It is not strange that a character of mystery should have attached to this luminous appearance, and that the ignorant should have ascribed its occurrence to some evil spirit. They called it "Will o' the wisp," and "Jack with a lantern;" and this imaginary person is often alluded to by the old English poets; thus Parnell, in his "Fairy Tale":

Then Will, who bears the wispy fire,
To trail the swains among the mire.

It is commonly believed that the light retires before one who pursues it; and this notion is confirmed by the statements of some observers, and disproved by those of others. In vol. xvi. of the "American Journal of Science," p. 246, instances are noticed, in a paper by the Rev.

John Mitchell of Connecticut, of persons coming up with the light, one man catching it in his hat, but finding nothing there. In Milner's "Gallery of Nature," p. 544, is recorded a statement of Mr. Blesson, who carefully investigated the phenomena in the forest of Gorbitz, in Brandenburg. On a marshy spot he observed bluish purple flames at night, where bubbles of air issued during the day. These flames retired as he approached, in consequence, he supposed, of the air being agitated by his movement. On standing perfectly still they soon appeared within reach; and then, carefully guarding against disturbing the air by his breath, he succeeded in singeing a piece of paper, which became covered with a viscous moisture. At last, using a narrow slip of paper, he had the pleasure of seeing it take fire. By disturbing the air over the spot he caused the flames to disappear entirely, but in a few minutes after quiet was restored they appeared again over the air bubbles, apparently without having communication with any known source of flame. On suddenly introducing a torch after extinguishing the flames, a kind of explosion was heard, and a red light was seen over 8 or 9 square feet of the marsh, which diminished to a small blue flame from 2½ to 3 feet in height. He concluded that the cause of the ignis fatuus was the evolution of inflammable gas from the marsh, and that the flames existed by day as well as at night, though not then visible. The lights seen occasionally over churchyards are of similar appearance to those described. These meteors are supposed to be the result of the spontaneous combustion of inflammable gases generated by the decomposition of vegetable or animal bodies. Phosphuretted hydrogen, it is well known, bursts into flame as it is allowed to escape into the air from the vessels in which it is prepared. It is produced by the decay of animal matters, and, if thinly diffused here and there over the surface of a marsh, may present the changing, flickering light of the ignis fatuus, as difficult to locate as the illumination of the fireflies, for which it has been mistaken by several eminent naturalists. What is known as marsh gas is a highly inflammable carburetted hydrogen, which bubbles up through the water that covers boggy places, and may be inflamed on the surface. (See GAS.) This may be ignited by phosphuretted hydrogen, and add to the extent and permanency of the flames. The small quantity of these combustible matters present in the air will account for the feebleness of the flames, which have rarely been known to set fire to other substances; and the varying quantity and purity of that exhaled would explain the constantly shifting brightness of the light. In the account of this phenomenon in the "Gallery of Nature" referred to, it is stated that in the middle of the last century the snow on the summit of the Apennines appeared enveloped in flame; and in the winter of 1693 hay ricks in Wales were set on fire by burning gaseous exhalations.

IGUANA, a lizard constituting the type of

the family *iguana*. The family characters are: a body covered with horny scales, without bony plates or tubercles, not disposed in circular imbricated series, and without large square plates on the abdomen; there is generally a crest along the back or the tail; no large polygonal scutes on the head; the teeth sometimes in a common alveolus, and sometimes united to the free edge of the jaws; tongue thick, free only at the point, and without sheath; eyes with movable lids; toes distinct, free, and all unguiculated. The very numerous genera of this family have been conveniently divided into two sub-families by Duméril and Bibron, according to the manner in which the teeth are implanted; in the pleurodonts, all but one American, the teeth are arranged in a groove of the jaws, are attached to their inner surface, and are often curiously flattened and serrated on the free edge; in the acrodonts, all genera of the eastern hemisphere, there is no such groove, and the teeth grow upon the edge of the jaws. For the characters of the second sub-family, which contains 15 genera and about 60 species, see DRAGON, and STRELIO, and the genus *agama*, below. The pleurodonts comprise 31 genera and more than 100 species; *anolis* and *basileus* have been already noticed, and the only genus here described will be *iguana* (Laurenti). The characters of this genus are: a very large thin dewlap under the throat; cephalic plates flat, unequal, and irregular; a double row of small palate teeth; a crest on the back and tail; fingers and toes 5, long, of unequal lengths, the 4th of the hind foot very long; a single row of femoral pores; tail very long, slender, compressed, and covered with small, regular, imbricated, ridged scales. The common iguana (*I. tuberculata*, Laur.) attains a length of 4 or 5 feet, of which the tail is about two thirds; it is found in tropical South America and the West Indies. The nasal openings are at the end of the obtuse muzzle; the teeth are about 50 in each jaw, with eard-like ones on the palate in two series; the dewlap is about as deep as the head, triangular, having about a dozen serrations on its anterior border; along the neck and back is a comb-like crest of about 55 scales, highest in this species, extending on to the tail, where it becomes a simple serrated ridge; the femoral pores are 14 or 15, widest and opening in a single scale in the males. The color above is greenish, with bluish and slaty tints, and greenish yellow below; on the sides are generally brown zigzag bands with a yellow border, with a yellowish band on the front of the shoulder; some are dotted with brown, with yellow spots on the limbs; the tail is ringed broadly with alternate brown and yellowish green. The flesh of the iguana is considered a great delicacy, though it is not peculiarly wholesome. It passes most of its time in trees, in which it is caught by slip nooses; it is said to be a good swimmer, and some of the sub-family, as *amblyrhynchus*, pass most of their time in the water, and even in the sea. The *I. rhinolopha* (Wieg.)

is found in Mexico and the West Indies. The naked-necked species, *I. nudicollis* (Cuv.), has a less elevated crest, no tubercles on the neck on each side of the crest, and a row of large scales along each branch of the lower jaw; it is smaller than the common iguana, and of a more uniform bluish green color; it is found in South America and the West Indies.—The iguanas of the eastern hemisphere, of the acrodont sub-family, are often called agamas, from one of the principal genera. The genus *agama* (Daudin) has a flat triangular head, neck, and sometimes the ears spiny, body covered with small imbricated scales, no dorsal crest, tail long, slender, and rounded, anal but no femoral pores, a longitudinal fold along the throat, and sometimes a transverse one; the teeth are united to the edge of the jaw, and may be distinguished into posterior or molars and anterior or canines and incisors; no teeth on the palate. None of this sub-family are found in America. The common agama (*A. colonorum*, Daudin) is the largest of the genus, being from 12 to 16 inches long, of which the tail is more than half; it is found on the Guinea and Senegal coasts. The spiny agama (*A. spinosa*, Seba), the orbicular lizard of authors, is short and thick in form, with short tail and spiny scales; it is about 7 inches long, and inhabits the Cape of Good Hope. Others of the acrodonts live in Asia and Australia, and some are of very strange forms; the habits and general appearance are like those of the American iguanas.

IGUANODON, a gigantic fossil saurian reptile, discovered by Dr. Mantell in the wealden formation of Great Britain in 1822, and so named from the teeth resembling in shape those of the iguana. The teeth of the iguanodon resemble those of the iguana also in the elongation and contraction of the base, the expansion of the crown, the serration of the edges, and the thin coating of enamel; but the crown is relatively thicker, with a more complicated external and internal structure, and the roots are placed on separate sockets as in the crocodile. The vertebrae have slightly concave articular surfaces on the body, with nearly flat sides; the neural arch of the dorsals is high and expanded, as in other dinosaurians; the antero-posterior diameter is from 4 to 4½ inches; the spinal canal is completely enclosed by the neural arches; the sacral region is of considerable extent, and widely embraced by the iliac bones; in the tail the spinous processes increase for some distance below the sacrum and then diminish, and this organ was probably relatively shorter than in the iguana; the ribs are largely developed in the thoracic and abdominal regions, and have a connection both with the body and the transverse process of each vertebra, as in other dinosaurians and in crocodiles, differing in this respect from the iguana and other lizards; the scapular arch is intermediate between the crocodilian and lizard type, the clavicle being more than 3 feet in length; the pelvic arch has rather a lacertian character; the thigh bones

are stout, and about 3 feet long, with the head rounded and produced, as in mammals, over the inner side of the shaft, and a singularly flattened trochanter, and must have supported the heavy body in a manner like that of the large pachyderms; the bones of the leg are robust, and about $2\frac{1}{2}$ feet long, and the whole extremity bears little resemblance to that of the iguana; the feet resemble those of saurians. This reptile has been estimated by Owen as about 28 feet in length, of which the head was 3 and the tail 13 feet; the discoverer made it a much larger animal, ascribing to it a length of 60 or 80 feet; it stood higher on the legs than any existing saurian, and was terrestrial in its habits; the worn condition of the teeth indicates that it was a herbivorous animal. For details see Prof. Owen's "Report to the British Association" in 1841, pp. 120-144. It belongs to the family of dinosaurians with *megalosaurus*, *hylæosaurus*, and *pelorosaurus*, and is found in the wealden and cretaceous formations. The *I. Mantelli* (Cuv.), from the characters of the worn dental surfaces, must have performed a true process of mastication, and the glenoid cavity must have permitted a lateral movement of the lower jaw; the large facial foramina indicate more fleshy cheeks and lips than in any existing saurians. Mr. Mantell was of opinion that it had a nasal integumental horn.

IHRE, JOHAN, a Swedish philologist, born in Lund, March 3, 1707, died Dec. 1, 1780. His father, of Scotch descent, was for a time professor of theology at Upsal. He was graduated at the university in 1730 with distinguished honors, and passed 3 years in travelling, residing chiefly in London, Oxford, and Paris. In 1737, after several minor appointments, he received the professorship of belles-lettres and political science at Upsal, which he retained till his death. In translating into Swedish Sir Richard Steele's "Lady's Library" (3 vols., Stockholm, 1734-'8) he was led to make reflections on the state of the Swedish language, which, being enlarged and published, established his reputation as a scholar and critic. His *Glossarium Sueco-Gothicum* (2 vols., Upsal, 1769) was prepared under the patronage of the government, which allowed him in 1756 a grant of 10,000 Swedish dollars. It forms an important work on Swedish philology, containing investigations as to the origin and affinities of the principal words. He was the author of 453 academical dissertations, many of which, especially those on the Eddas and on Ulphilas, are of high importance. The latter were collected by Büsching under the title of *Scripta Versionem Ulphilanam et Linguam Mæso-Gothicam Illustrantia* (Berlin, 1773).

ILIAD. See HOMER.

ILISSUS, a river of Attica, rising near the N. extremity of Mt. Hymettus, and flowing through the S. part of Athens toward the Phaleric bay, which however it rarely reaches even in the rainy season, while in the summer it always dries up in the vicinity of the city. The spreading plane trees and verdant banks which the

Ilissus could boast in the days of Plato, and which he has immortalized in his *Phædrus*, have given place to pigmy bushes and sun-burnt rocks.

ILIUM. See TROY.

ILLE ET VILAINE, a maritime department in the N. W. of France, bounded N. by the English channel and the department of Manche, E. by the department of Mayenne, S. by that of Loire-Inférieure, and W. by those of Morbihan and Côtes-du-Nord; area, 2,596 sq. m.; pop. in 1856, 580,898. It is named after its principal rivers, Ille and Vilaine, and was formed out of a portion of the old province of Brittany. It is traversed from W. to E. by the Armoric hills or Menez mountains. The surface is irregular; the soil produces all kinds of grain. Flax and hemp are extensively cultivated; tobacco is grown to some extent, as are grapes and other fruit. The fisheries are important, and excellent oysters are found in the bay of Cancale. Several iron mines are worked; slate, quartz, limestone, and granite are quarried; lead and copper ore are found; mineral springs are numerous. The manufactures consist chiefly of coarse linen and sail cloth. The coasting trade is active, and occupies about 600 vessels. Notwithstanding so many elements of prosperity, there are more paupers in this than in other French departments, there being about 70,000. It is divided into 6 arrondissements, Rennes, Fougères, Montfort, St. Malo, Vitre, and Redon, and belongs to the 5th military division formed in 1858. It is traversed by the railway from Rennes to Paris. The principal seaport is St. Malo. Capital, Rennes.

ILLINISSA, PYRAMIDS OF, certain peaks of the Cordilleras of Quito, in South America, about 10 m. S. from Quito. They are 16,362 feet high, and seem originally to have constituted a single mountain, which has been rent apart by volcanic forces. They are visible not only from all parts of the country intervening between the Cordilleras of Quito and the Pacific, but from great distances at sea.

ILLINOIS, one of the interior states of the American Union, and the 8th admitted under the federal constitution, situated between lat. $36^{\circ} 56'$ and $42^{\circ} 30' N.$, and long. $87^{\circ} 25'$ and $91^{\circ} 40' W.$; extreme length N. and S. 388 m., extreme breadth E. and W. 212 m.; area, 55,405 sq. m., or 35,459,200 acres. It is bounded N. by Wisconsin, N. E. by Lake Michigan, E. by Indiana, from which it is separated in part by the Wabash river, S. by Kentucky and the Ohio river, and W. by Missouri and Iowa and the Mississippi river. The state is divided into 101 counties, viz.: Adams, Alexander, Bond, Boone, Brown, Bureau, Calhoun, Carroll, Cass, Champaign, Christian, Clark, Clay, Clinton, Coles, Cook, Crawford, Cumberland, De Kalb, De Witt, Douglas, Du Page, Edgar, Edwards, Effingham, Fayette, Franklin, Fulton, Gallatin, Greene, Grundy, Hamilton, Hancock, Hardin, Henderson, Henry, Iroquois, Jackson, Jasper, Jefferson, Jersey, Jo Daviess, Johnson, Kane,

Kankakee, Kendall, Knox, Lake, La Salle, Lawrence, Lee, Livingstone, Logan, McDonough, McHenry, McLean, Macon, Macoupin, Madison, Marion, Marquette, Marshall, Mason, Massac, Menard, Mercer, Monroe, Montgomery, Morgan, Moultrie, Ogle, Peoria, Perry, Piatt, Pike, Pope, Pulaski, Putnam, Randolph, Richland, Rock Island, St. Clair, Saline, Sangamon, Schuyler, Scott, Shelby, Stark, Stephenson, Tazewell, Union, Vermilion, Wabash, Warren, Washington, Wayne, White, Whitesides, Will, Williamson, Winnebago, Woodford. Springfield, near the geographical centre of the state, lat. 39° 48' N., long. 87° 35' W., is the seat of government. It is situated in the midst of a fine agricultural district, and has an active trade, being well supplied with railroad facilities. Chicago is the commercial metropolis, and the largest city on the northern lakes. The other most important cities and towns are Alton, Belleville, Bloomington, Freeport, Galena, Jacksonville, Joliet, La Salle, Ottawa, Peoria, Peru, Quincy, Rockford, Rock Island, &c. Kaskaskia and Cahokia on Kaskaskia river are the oldest towns in Illinois, having been founded by the French in 1673. Kaskaskia was the first capital, and so remained until 1818, when the government removed to Vandalia, which it left in 1839 for Springfield. Among the towns of Illinois may also be mentioned Nauvoo, a city built at the head of the upper rapids of the Mississippi. It was founded by the Mormons in 1840, and once contained from 15,000 to 18,000 inhabitants. The temple, a large edifice built of polished limestone, was destroyed by fire in 1848. Nauvoo was abandoned by the Mormons in 1845, and in 1850 was purchased by the Icarian socialists under M. Cabet, but the colony has been substantially broken up and dispersed, and the city is almost uninhabited. The city has a good landing.—The population of Illinois in 1810 and at subsequent decennial periods was as follows:

U. S. Census.	White.	Free Colored.	Slaves.	Total.
1810.....	11,501	613	168	12,282
1820.....	53,753	457	917	55,211
1830.....	155,061	1,637	747	157,445
1840.....	472,254	3,593	331	476,183
1850.....	846,034	5,436	...	851,470

The state census of 1855 gave a total population of 1,306,576. Of the white population in 1850 there were 445,544 males and 400,490 females; of the free colored (blacks 2,930 and mulattoes 2,506), 2,777 were males and 2,659 females. Deaf and dumb, 356; blind, 264; insane, 238; idiotic, 363. Density of population, 15.37 to the square mile; proportion to that of the whole Union, 3.07 per cent. Dwellings, 146,544; families, 149,153. Born in Illinois, 343,618; in other states, 393,313; in foreign countries, 110,593; unknown, 3,946; natives of Illinois in other states, 45,889. Of the natives of other states there were from Indiana 30,953, Kentucky 49,588, New York 67,180, North Carolina 13,851, Ohio 64,219, Pennsylvania 37,979, Ten-

nessee 32,303, Vermont 11,381, Virginia 24,697. Of the foreigners, 57,647 were British and Irish, 10,699 British American, and 38,446 German. There were 479,602 under 20 years of age, 365,341 between 20 and 70, 5,714 between 70 and 100, 18 over 100, and 795 unknown. Male persons over 15 years of age occupied in various pursuits, 215,359, viz.: in commerce, trade, manufactures, the mechanic arts, and mining, 36,232; in agriculture, 141,099; in labor not agricultural, 29,778; in sea and river navigation, 1,644; in law, medicine, and divinity, 3,307; in other pursuits requiring education, 2,071; in government civil service, 701; in domestic service, 376; and in pursuits not specified, 154. Births (1849-'50), 26,681; marriages, 9,183; deaths, 11,619. The total federal population (851,470) entitles the state to 9 representatives in congress.—Illinois occupies the lower part of that inclined plane of which Lake Michigan and both its shores are the higher sections. Down this plane in a very nearly S. W. direction the principal rivers have their courses to the Mississippi. The lowest section of this plane is also the extreme S. angle of the state, and is elevated only 340 feet above the gulf of Mexico. The greatest elevation of the country is 800 feet, and the mean elevation about 550 feet, above tide water. Next to Louisiana and Delaware, indeed, Illinois is the most level state of the Union. A small tract in the N. W. corner of the state around Galena, which includes the lead mines, is hilly and somewhat broken, and there are also bluffs on the Mississippi and Illinois rivers; but by far the greater portion of the surface consists of vast level or gently undulating prairies. The chief rivers within the limits of the state are the Rock, Illinois, Kaskaskia, &c., affluents of the Mississippi; the Embarras and Little Wabash, tributaries of the Wabash; and the Saline and Cash, which fall into the Ohio. The Illinois is much the largest of these; its constituents are the Kankakee from Indiana and the Des Plaines from Wisconsin, and in its course of nearly 500 m. (245 navigable) to the Mississippi it receives the Fox and Spoon rivers and Crooked creek from the N., and the Vermilion, Mackinaw, Sangamon, &c., from the S. It has a wide deep bed, and in some parts opens into broad and lake-like expanses. Rock river also rises in Wisconsin, and has a course of 300 m. to the Mississippi; it is imperfectly navigable for 250 m., and its upper course is impeded by rapids. The Kaskaskia has its sources in Champaign co. (in which also rise the Sangamon, Embarras, and the S. constituents of the Vermilion), and pursues a direction nearly parallel with the Illinois; it has a length of 250 m. Big Muddy is also a considerable stream. The rivers flowing into the Ohio and Wabash are generally of less volume than the smaller class of streams flowing into the Mississippi, but several are navigable. Chicago river falls into Lake Michigan; it is formed by the union of its N. and S. branches about 1

m. from the lake. Both branches are deep (12 to 15 feet), and in connection with the main river form a spacious harbor, which has been much improved by the extension of piers far into the lake. The S. branch is connected with the navigable Illinois at Peru, by the Illinois and Michigan canal, 100 m. long.—Notwithstanding the general uniformity of the surface, Illinois is not destitute of interesting scenery. The prairies inspire in the mind a feeling of sublimity from their very vastness, and their gaudy summer livery gratifies the eye. The river bluffs contrast strikingly with the smooth prairies. The most remarkable of these elevations are on the Mississippi, and are from 100 to 400 feet high. Fountain bluff in Jackson co. is of an oval shape, 6 m. in circuit and 300 feet high; the top is full of sink-holes. Starved Rock and Lover's Leap are eminences on the Illinois; the first named is a perpendicular mass of limestone and sandstone, 8 m. below Ottawa, and 156 feet above the river, and the latter a ledge of precipitous rocks, some distance above Starved Rock. Nearly opposite to Lover's Leap is Buffalo Rock, 100 feet high, precipitous toward the river, but sloping inland. All these are objects of Indian legend. The Cave in the Rock, in Hardin co., on the Ohio, presents on approach a vast mass of rocks, some resembling castellated ruins, and others jutting out in a variety of forms. The entrance to the cave, which is little above high water, is a semi-circular hole 80 feet wide and 25 feet high, and the cave so far as explored consists of a chamber 80 feet long, at the end of which is a small opening which probably leads into a second chamber. In the earlier days of settlement it was the abode of bands of robbers and river pirates.—The unbroken surface of Illinois affords a drainage extending from the borders of Lake Michigan toward the W. and S. W. across the entire state. It is a remarkable fact that the canal which connects the great lakes with the Mississippi is fed by the waters of Lake Michigan, which are pumped up at Chicago to the summit level, only 12 feet above the surface of the lake itself. The post-tertiary clay and sands containing fresh water shells of living species, found a few feet above the level of the lake, and forming its banks, indicate that at no remote geological period the land was somewhat less elevated than at present; and the valley of the Illinois with its strongly marked terraced walls of limestone, so disproportioned to the small river that flows between them, would seem to owe its origin to mightier currents, and to point to a time when the great lakes found an outlet by this way to the Mississippi and the gulf of Mexico. The state, from the vast outspread of the carboniferous rocks over its surface, has been described and mapped as one great coal field; but as the arrangement of the strata has been more carefully studied this statement is to be received with some modifications. The prevailing rocks throughout the state are still, however, those of the coal meas-

nres. They occupy most of the country lying S. of a line traced from the mouth of Rock river E. to La Salle co., and thence S. E., crossing the line of Indiana. The formation covers a large portion of the W. part of Indiana, and stretches S. into Kentucky. Its W. margin is near the Mississippi river, along which a belt of the underlying carboniferous limestone comes up, and cuts off the coal formation on that side. The included area, reckoned as one coal field, presents a length of 375 m. from N. W. to S. E., and a maximum breadth from St. Louis toward the N. E. of about 200 m. The thickness of the coal measures being shallow when compared with the same formation in Pennsylvania and Ohio, and the strata moreover being thrown into waves, which traverse the state in a N. W. and S. E. direction, the amount of workable coal is comparatively small for the area, and the inferior limestones and sandstones are often brought to the surface, so as to divide the coal field into numerous basins. It is the opinion of Dr. J. G. Norwood that the strata in these basins were deposited subsequently to the upturning of the lower rocks, upon the edges of which they rest. This is especially observed near the N. E. limits of the coal field, near La Salle; and according to Prof. Hall, the coal-bearing rocks extend N. beyond the outcrop of the carboniferous limestones, and spread over the edges of the lower formations as these in succession are brought toward the surface, till even the lower silurian are thus capped by the coal. In this basin J. W. Foster describes 3 coal beds, the lowest, of $3\frac{1}{2}$ to 4 feet thickness, sometimes laid directly upon the edges of the older rocks, and sometimes separated from them by a thin layer of slate. Between this and the middle bed, which is about 6 feet thick, including one foot of cannel coal, are beds of slate, limestone, and sandstone, amounting to 176 feet, and over this other similar beds amounting to 53 feet in thickness to the upper coal bed, which is nearly 4 feet thick. In Indiana and Kentucky the coal measures of this field present a much greater thickness and a larger number of workable beds. The coals are all bituminous, some being cannel, and in their large percentage of volatile matter affording the best varieties for producing coal oil and paraffine. Their average composition is from 45 to 50 per cent. of fixed carbon, and from 35 to 40 cent. of volatile bituminous matter. The proportion of ash is large, sometimes amounting to 20 per cent., and not often falling below 4 or 5. A specimen from the bed largely worked at Rock Island for supplying the towns on this portion of the Mississippi river was found by J. D. Whitney to present the following composition:

Hygrometric moisture.....	7.96	} Total volatile 45.73
Volatile combustible matter.....	37.77	
Fixed carbon.....	53.15	} Coke.....54.27
Ash.....	1.12	
Total.....	100.00	

The importance of the coal beds of Illinois is greatly enhanced by their position, conveniently

near the Mississippi or the Ohio, and to the railroads, which traverse the state from N. to S. and from E. to W. The iron ores found in the coal measures are of little value. In the article **GEOLOGY** the occurrence of strata of the permian group is mentioned as having been discovered in 1857 in the S. E. part of Illinois—the first observation in the United States of newer strata overlying conformably the coal measures. The N. W. corner of Illinois includes a portion of the great western lead-bearing belt. Though in Illinois but a small district, comprising part of Jo Daviess co., contains the lower silurian limestones in which the lead ores are found, the mines have proved so productive, that the metal ranks as one of the important products of the state. The shipments from Galena down the Mississippi include the lead brought to that place from the Wisconsin mines; an account of which, with the statistics of production, will be found in the article **LEAD**. Salt is chiefly a product of the southern section, and is found in springs about the head waters of Big Muddy river, Saline creek, and the Little Wabash. Sulphurous and chalybeate springs exist in several localities.—The soils of Illinois are of diluvial origin, and it is probable that in the early geological ages the whole state was a portion of the bed of a great lake. The prairie soils are deep, fertile, and rockless, and produce a luxuriant growth of native grasses and vegetation, which formerly sustained countless herds of buffaloes. In the summer season the surface appears "like an ocean of flowers of various hues waving to the breezes that sweep over them." The largest of the Illinois prairies is that between the streams flowing into the Wabash and those which enter the Mississippi. This is called the Grand Prairie, but is properly a combination of small prairies partially separated by tracts or groves of timber. The barrens, or oak-openings as they are here called, have frequently a thin soil. In the bottoms or alluvial borders of the rivers the soil is chiefly formed from the deposits of the waters during floods. In some cases the mould so formed is 25 feet and upward in depth, and of inexhaustible fertility. One fifth of the alluvial land, however, is unfit for present cultivation, but is productive of timber. A tract called the American bottom, extending along the Mississippi for 90 m., and about 5 m. in average breadth, is of this formation. About the French towns it has been cultivated and produced Indian corn every year without manure for nearly two centuries. In every part of the state the plough may pass over thousands of acres without meeting even so much as a pebble to impede its course.—The prevailing winds in Illinois are the N. and N. W. and the S. and S. W., the former in the winter months, and the latter during the remainder of the year. The evenness of the surface allows of their free passage, and whether in boreal blasts or in summer's gentle breezes the atmosphere is in constant motion. Hence the winters are excessively

cold, and the summers more than usually hot. The summer heat, however, is greatly modified and refreshed by the ever present breezes; and on the whole the climate is favorable for outdoor occupations, the proportion of clear and cloudy days being about 245 of the former to 120 of the latter. The mean annual temperature on the 40th parallel is about 54°, that of summer 77°, and that of winter 33½° F. These figures, however, will vary considerably to the N. and S. of the parallel indicated; at Beloit on the N. line the mean temperature is 47½°, and at Cairo, the S. angle of the state, 58½°. Vegetation begins with April, and the first killing frosts occur near the end of September. The general salubrity of the climate is well attested; but fevers and fluxes are frequently prevalent in the river bottoms and in the swamps which cover a large part of the southern section. The upland prairies are almost free from endemic disorders.—The native animals are now almost extinct, but still Illinois has abundance of game for the sportsman, and its northern rivers abound in trout and other fish. The kinds of timber most abundant in Illinois are oak, black walnut, ash, elm, sugar maple, locust, linden, hickory, pecan, persimmon, &c. In the S. and E. yellow poplar and beech are the peculiar growths, and near the Ohio are clumps of yellow pine and cedar. The bottoms produce cottonwood, sycamore, &c. Illinois indeed is abundantly supplied with timber, but it is unequally distributed, and immense tracts are entirely bare. The fruit trees embrace the apple, peach, cherry, plum, &c., and the grape is largely cultivated.—In 1850 Illinois contained 76,208 farms, covering 12,037,412 acres of land, and of this area 5,039,545 acres were improved. Value of farms \$96,133,290, and of implements and machinery thereon \$6,405,561. Live stock: horses 267,653, asses and mules 10,573, milch cows 294,671, working oxen 76,156, other cattle 541,209, sheep 894,043, and swine 1,915,907; value, \$24,209,258; value of animals slaughtered in the preceding year, \$49,722,286. The products of agriculture for the year ending June 1, 1850, were: wheat 9,413,575, rye 83,364, oats 10,087,241, Indian corn 57,646,984, barley 110,795, buckwheat 184,504, potatoes 2,514,861, and sweet potatoes 157,433 bushels; hay 601,952 tons; clover seed 3,427, and other grass seed 14,380 bushels; flax seed 10,787 bushels; flax 160,063 lbs.; hops 3,551 lbs.; butter 12,526,543, and cheese 1,278,225 lbs.; peas and beans 82,814 bushels; market garden products \$127,494, and orchard products \$446,049; beeswax and honey 869,444 lbs.; maple sugar 248,904 lbs., and molasses 8,354 galls.; tobacco 841,394 lbs.; wool, 2,150,113 lbs.; silk cocoons 47 lbs.; wine 2,997 galls.; home-made manufactures \$1,155,902, &c. Of the total crops of certain staples Illinois produced the following percentage: wheat 9.37, Indian corn 9.73, tobacco 0.42, and wool 4.10; and the average crops per acre were: wheat 11, rye 14, corn 33, oats 29, barley 40, buckwheat 15, and Irish

potatoes 115 bushels. The total value of agricultural products in 1839-'40 was \$11,577,281, and in 1849-'50 \$57,404,114. The number of establishments engaged in manufactures, the mechanic arts, and mining in 1850 was 3,164, among which are enumerated 16 woollen factories, 31 iron works, viz., 2 for pig iron and 29 for castings, 52 distilleries and breweries, and 1 salt manufactory; and in these was invested an aggregate capital of \$6,385,387. The number of hands employed averaged 12,065, viz., 11,632 males and 433 females, and the cost of labor in the year was \$3,286,249; the value of raw material used was \$8,915,173, and of products \$17,236,073. The value of products (including home-made goods) in 1810 was \$117,853, in 1840 \$8,021,582, and in 1850 \$19,071,075. It is probable that the values produced in all branches of industry are at the present time (Jan. 1860) double those noted in the census of 1850.—Illinois has but a small direct foreign trade; its products are transported by land or water conveyance to the seaports, and its imports are made through the same avenues. The exports to foreign countries direct in the year ending June 30, 1858, were valued at \$1,713,077, all being domestic products. The imports from foreign countries were valued at \$222,930. This trade is mainly with Canada. The amount of shipping owned in the state in 1858 was 73,005 (steam 14,001) tons; of this 67,001 (steam 8,151) tons belonged to Chicago, 155 tons to Alton, and 5,850 (all steam) to Galena. This shipping was all of the class of enrolled and licensed, and employed in the coasting trade. Seven vessels (586 tons) were built in the year.—The system of railroads in Illinois is very extensive, and the mileage already completed exceeds that of any other state with the exception of New York, Pennsylvania, and Ohio, being in Dec. 1858, about 2,750 m. With little exception, these works have been completed within 8 years; in 1850 the state had only 22 m. The principal lines now in operation are as follows:

Roads.	Termini.	L'th, m.	Cost.
Illinois Central.....	Cairo to Centralia, Chicago, and Dunleith...	703	\$28,437,669
Galena and Chicago Union.....	Chicago to Beloit, Freeport, and Fulton	459½	9,395,455
Chicago, Alton, & St. Louis.....	Joliet to Alton.....	220	9,535,011
Terre Haute, Alton, and St. Louis.....	Terre Haute to E. St. Louis.....	203	8,726,763
Chicago, Burlington, and Quincy.....	Aurora to Galesburg...	133	7,468,925
Chicago & Rock Isl'd	Chicago to Rock Island	182	6,776,113
Peoria and Ogawka	E. Burlington to Peoria and Gilman.....	186	5,400,000
Great Western.....	Naples to Indiana line	175	5,022,926
Ohio and Mississippi	Vincennes to Illinois'n	143	4,370,556
Chicago, St. Paul, & Fond du Lac.....	Chicago to Janesville, &c.....	91	2,500,000
Peoria and Bureau Valley.....	Peoria to Bureau Junction.....	47	2,106,000
Quincy and Chicago	Quincy to Galesburg...	100	1,973,555
Chicago and Milwaukee.....	Chicago to Wisconsin line.....	45	1,700,000
Joliet and N. Indiana	Joliet into Indiana....	45	1,300,000
Joliet and Chicago...	Joliet to Chicago.....	35	800,000
Fox River Valley...	Elgin to Richmond...	33	560,000

There are also several shorter lines, and other
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lines are projected or under construction, which when completed will add largely to the present mileage. The Illinois and Michigan canal, as before stated, is 100 m. long; its width is 70 feet at the surface, and 30 feet at the bottom; depth 7 feet; with 17 locks, and lockage 158 feet. In 1860 Illinois had 48 banks; circulation \$2,846,179; specie \$269,585. These institutions are organized under the free banking law of 1853.—The government is based on the constitution dated Aug. 31, 1847. It secures the right of voting to every white male citizen 21 years of age, and who has resided in the state 12 months. The general assembly consists of a senate of 25 members elected for 4 years, one half biennially, and a house of representatives of 75 members elected for two years. Representation is based on white population in equal districts. The governor (salary \$1,500) and lieutenant-governor (pay \$3 per day) are elected for 4 years. The principal administrative officers are the secretary of state (salary \$800 and fees), the auditor (salary \$1,000), the treasurer (salary \$800), and the superintendent of public instruction (salary \$1,500). The judiciary consists of a supreme court, 17 circuit courts, county courts, &c. Judges of the supreme court, 3 in number, are elected in divisions for 9 years, and have \$1,200 per annum; circuit court judges, 17 in number, are elected in their proper circuits for 6 years, and have \$1,000 a year; and county judges, whose duties are chiefly probate, are elected for 4 years. Cook co., in which Chicago is situated, has a special common pleas court, and the city of Chicago a recorder's court. The revenue of the state is derived chiefly from taxation. For the two years ending Nov. 30, 1858, the receipts amounted to \$753,011 99, and the expenditures to \$761,977 68. On Jan. 1, 1859, the state debt amounted to \$9,008,268 98. During the years 1857-'8, \$1,166,876 74 had been paid in liquidation of the public debt. The value of taxable property in the state in 1850 was \$119,868,336; in 1855, \$333,287,474; and in 1858, \$407,477,367. The principal institutions supported wholly or in part by the state are the institutions for the deaf and dumb, the blind, and the insane at Jacksonville, and the state prison at Alton. Paupers supported within the census year, 797, and on the list June 1, 1850, 434; annual cost \$45,213. Criminals convicted during the year, 316, and in prison, June 1, 1850, 252. According to the census of 1850, Illinois contained 1,223 churches, with accommodation for 486,576 persons, and property valued at \$1,482,185. Of these churches 282 were Baptist, 69 Christian, 46 Congregational, 2 Dutch Reformed, 27 Episcopal, 2 Free, 6 Friends', 3 German Reformed, 42 Lutheran, 405 Methodist, 2 Moravian, 206 Presbyterian, 59 Roman Catholic, 2 Swedenborgian, 4 Tunker, 30 Union, 4 Unitarian, 7 Universalist, and 25 minor sects. The educational institutions in the same year consisted of 4,052 public and primary schools, with 4,248 teachers, and 125,725 scholars—annual

income \$349,712; 83 academies and private schools, with 160 teachers and 4,244 scholars— income \$40,488; and 6 colleges, with 35 teachers and 442 scholars— income \$13,300. Number of children attending school, as returned by families, 182,292. Persons over 20 years of age unable to read and write, 41,283. In 1858 the number of white children under 21 years of age was 809,879, and of these 457,113 attended school. The number of public schools was 10,238; of the teachers 7,503 were males and 5,878 females. The amount expended for school purposes was \$2,705,052. The state holds for educational purposes three separate funds, viz.: the common school fund, \$799,083, and the college and seminary funds, \$152,421. These funds produce 6 per cent. The counties own school-funds estimated at \$50,000, and the township funds to the amount of \$1,952,090; these are invested at 10 per cent. Altogether the principal of the educational funds amounts to \$2,953,594. The principal collegiate institutions, with their latest statistics as far as known, are as follows:

Institutions.	Founded.	Inst'ors.	Students.	Vols. in libraries.
Illinois College, Jacksonville.....	1830	7	70	3,660
Shurtleff " Upper Alton.....	1835	6	40	1,900
McKendree " Lebanon.....	1835	6	82	5,500
Knox " Galesburg.....	1837	7	56	3,300
Baptist Theol. Seminary, Upper Alton...	1835	..	..	..
St. Mary's Theological Seminary, Chicago	..	..	..	..
Rush Medical College, Chicago.....	1842	6	..	..

Among the literary associations of Illinois, the principal are the Chicago historical society, founded May 24, 1856, and the Illinois literary and historical society, located at Alton. The number of periodicals in 1850 was 107, circulating 88,623 copies, or annually 5,102,276. Of these, 8 were issued daily, 4 tri-weekly, 84 weekly, 3 semi-monthly, 7 monthly, and 1 quarterly; and 22 were literary and miscellaneous, 1 neutral and independent, 73 political, 8 religious, and 3 scientific. Libraries (other than private) 152, with 62,486 vols., viz.: 33 (35,982 vols.) public, 29 (5,875 vols.) school, 86 (12,829 vols.) Sunday school, and 4 (7,800 vols.) college libraries.—Illinois derives its name from its principal river. The first settlements were made by the French, and were the consequence of the enterprise of La Salle. This traveller set out from Canada in 1679, and passing across the lakes descended the Illinois river. After examining the country, with which he was highly pleased, he returned to Canada, leaving the Chevalier de Tonty in command of a small fort he had built and named Cr vecoeur. In 1682 he returned to Illinois with a colony of Canadians, and founded Kaskaskia, Cahokia, and other towns. At the beginning of the 18th century the settlements in Illinois are represented to have been in a flourishing condition, and the country was described by French writers as a new paradise. The settlers, however, gradually degenerated, and by degrees assimilated their manners to those of the Indians among whom they dwelt. As the colonies of France and England extended, disputes arose between the two nations respecting boundaries, and these ultimately led to the war which virtually ended with the capture of Quebec, and which in 1763 terminated the French dominion over any part of the country E. of the Mississippi. During the continuance of Illinois as a British dependency nothing of importance appears to have occurred, nor were the French settlements molested. At the peace of 1783, which closed the American revolution, the Illinois country was yielded to the United States; and by the ordinance of July 13, 1787, the whole of the public domain N. of the Ohio river was erected into the North-West territory under a single government. In 1800 the territory contained a population of 50,240, and in the same year Ohio was erected into a separate territory. A further severance was made in 1805, when the territory of Michigan was formed, and again in 1809 Indiana was divided off. The Illinois territory at this time included what are now the states of Illinois and Wisconsin and a part of Minnesota, and by the census of 1810 was found to contain 12,282 inhabitants. Hitherto the settlement of these territories had been greatly impeded by Indian hostilities, and indeed the early history of Illinois is one continued narrative of contests with the savages. Among the prominent events of this period is the massacre near Fort Chicago, Aug. 15, 1812. When hostilities finally ceased, population began to flow in from the eastern states, and by a census taken in 1818 it was found to amount to 35,220. In the same year, Dec. 3, Illinois with its present limits was admitted as a state into the Union. Two years later the U. S. census returned 55,211 inhabitants. During the succeeding decade immigration increased at a rapid rate, and in 1830 the population was ascertained to be 157,445, or an increase of 185.2 per cent. over that of 1820. In 1831 the Sac and other Indian tribes began to be troublesome, and in 1832 the Black Hawk war broke out. The alarm caused by these hostilities was great, but the result was ultimately beneficial to the state; not only was a permanent peace conquered, but the officers of the army on their return reported so favorably of the character and resources of the country, that general attention was directed to the state. Shortly afterward congress granted an appropriation for the improvement of Chicago harbor, and about this time the Illinois and Michigan railroad was projected, and the state bank brought into successful operation. On July 4, 1836, the construction of the canal was commenced. The succeeding year brought the greatest financial revulsion in our history, and in this no other state was more seriously involved than Illinois. Every interest was prostrated, and all works of internal improvement abandoned. The progress of the state, however, had been rapid, and by the census of 1840 the population numbered

476,183, being an increase of 202.4 per cent. over that of 1830. In this year the Mormons established themselves at Nauvoo, and were from the first disliked by their neighbors. Mutual hatred ended in open hostilities, and at length the brothers Joseph and Hyrum Smith (the first named the founder of Mormonism) were arrested, and while confined in Carthage gaol set upon and murdered by a mob. This occurred on June 27, 1844, and was followed soon after by a general exodus of the Mormons, who now numbered about 20,000 souls, toward Utah. In 1845 the population, according to a state census, was 643,452. In 1847 a new constitution was framed. The U. S. census of 1850 showed a population of 851,470, an increase of 80.7 per cent. in the decade. This was a much lower rate of increase than had hitherto been maintained, but was still a rapid growth. In the meanwhile emigration had been directed to Iowa and Wisconsin. But a new era of prosperity was now opening for Illinois. In the same year congress made a munificent grant of land in aid of the construction of the central railroad. This work was completed in 1856, and has answered all the purposes of its projectors. The country along both sides of its route has been rapidly settled, cities and towns have risen like emanations of magic in the midst of the prairie wilderness, and the prosperity of the state through the influence of this and other great works simultaneously completed has become so general that the last acre of government land in Illinois has been disposed of. But the most striking effect of these works is exhibited by the state census of 1855, which shows in the 5 years then ending an addition to the population of 455,106, or 53.4 per cent. Should the same rate have been maintained for the succeeding 5 years, the population in 1860 will be 1,971,257, nor is this result beyond the reach of probability.

ILLINOIS, a river of the United States, and the largest in the state to which it gives its name. It is formed at Dresden, Grundy co., in the N. E. part of the state, about 45 m. S. W. from Lake Michigan, by the union of Kankakee and Des Plaines rivers, the former of which rises in the N. part of Indiana and the latter in the S. E. of Wisconsin. The Kankakee receives the Iroquois, and from that point to its junction with the Des Plaines is sometimes known as the Iroquois. The Illinois flows nearly W. to Hennepin, in Putnam co., and thence S. W. and finally S. until it unites with the Mississippi between Calhoun and Jersey counties, 20 m. above the mouth of the Missonri. It is about 500 m. long, is navigable naturally at high water for 245 m., and by means of improvements is to be rendered navigable at all seasons. It is deep and broad, in several places expanding into basins which might almost be called lakes. Peoria, the most important city on its banks, is built on the shore of one of these basins. Its principal affluents are the Fox, Spoon, Crooked creek, the Mackinaw, Sangamon, and Vermilion. Above the

mouth of the Vermilion, in La Salle co., it is obstructed by rapids, and a canal has been built from this point to Chicago, a distance of 106 m. Uninterrupted water communication is thus secured between the lakes and the Mississippi. The Illinois was explored in 1679-'80 by La Salle and Hennepin, who entered it by the Kankakee, which they reached from Lake Michigan by means of the St. Joseph river and a short portage, and sailed in canoes, La Salle as far as the present site of Peoria, and Hennepin to the Mississippi. In 1682 La Salle navigated the whole course of the river.

ILLUMINATI, the name of the religious society of the Alombrados in Spain at the end of the 16th century; of the Guerinets in France in the 17th; of an association of mystics in Belgium in the 18th century; and of various other societies founded by religious enthusiasts. The most important of them was that founded in 1776 by Adam Weishaupt, a German professor of canon law, and a man of great originality and depth of thought, with the ostensible object of perfecting human nature, of binding in one brotherhood men of all countries, ranks, and religions, and of surrounding the persons of princes with trustworthy advisers. Apostles, styled areopagites, were sent to various parts of Europe to make converts, and before the existence of the society became generally known, branches had been established in various parts of Germany, in Holland, and in Milan. Young men from 18 to 30 years of age, and Lutherans rather than Roman Catholics, were preferred as members. The grades were 8, viz.: novice, minerval, illuminatus minor, illuminatus major, cavalier, priest, regent, and king. The illuminati gained much influence by the accession to their ranks of Knigge the author, and by the sympathy of many freemasons. At the height of its prosperity the society had 2,000 members, and seems to have aimed at political power. But Knigge and Weishaupt could not agree, and this, as well as the opposition of the Roman Catholic clergy, proved fatal. In 1784 it was prohibited by the Bavarian government, and in 1786 its papers were seized. The distinctive appellation of "illuminati," or the enlightened, has been arrogated to themselves by other sects.—See Nerval, *Des illuminés* (Paris, 1852).

ILLYRICUM, ILLYRS, or ILLYRIA, an ancient country, divided into 2 parts. Illyris Barbara or Romana, the Roman province of Illyricum, included a part of the modern Croatia, the whole of Dalmatia, almost the whole of Bosnia, and a part of Albania. It was inhabited by more or less barbarous Illyrian tribes, who were supposed to have a common origin with the Thracians. The principal tribes, after whom the districts were called, were the Iapydes, Liburni, and Dalmatians. The Liburni were the first subdued by the Romans; and after the conquest of the Dalmatians, in the reign of Augustus, the entire country became a Roman province. After that time the Illyrians, and particularly the Dalmatians, formed an impor-

tant part of the Roman legions, and were esteemed the most warlike of the empire. Illyris Græca, or Illyria proper, embraced the greater part of the modern Albania. The territory of this division consisted principally of mountain pastures, with a certain proportion of fertile valley. The various tribes of the Grecian Illyrians were generally poor, rapacious, fierce, and formidable in battle; in earlier times the tribe of the Autariatæ held the first rank as warriors. They had the customs of tattooing their bodies and of offering human sacrifices, and were always ready to sell their military services to the highest bidder, like the modern Albanian Skipetars, in whom probably their blood yet flows. The Illyrians supplied the Greeks with cattle and slaves, often in exchange for salt. Wax and honey were probably also articles of export. Grecian exiles found their way into Illyria, and Grecian myths became localized here. The Illyrians were subdued by Philip of Macedon, the father of Alexander the Great, 359 B. C. After the death of Alexander, most of the tribes recovered their independence, but their piracies gave umbrage to the Romans. The Roman ambassadors who protested against their depredations were murdered by the Illyrian queen Teuta. The first Illyrian war was commenced in 230 B. C., and the queen was obliged in 229 to make peace by the surrender of part of her dominions. The second war, commenced by Demetrius of Pharos, the guardian of the Illyrian prince Pineus, was successfully terminated by the consul L. Æmilius Paulus in 219. Pleuratus, the successor of Pineus, cultivated the friendship of the Romans, but his son Gentius formed an alliance with Perseus, king of Macedon. He was conquered in the same year as Perseus, and Illyria as well as Macedon now became subject to Rome (168 B. C.). In the new organization under Constantine, Illyricum was one of the great divisions of the empire, and was divided into Occidentale, including Illyricum proper, Pannonia, and Noricum, and Orientale, comprising Dacia, Mœsia, Macedonia, and Thrace. On the fall of the western empire (A. D. 476) it was attached to the eastern empire. In the 6th century the Slavic settlers from northern Europe separated themselves from the Byzantine government, and laid the foundation of the governments of Croatia and Dalmatia. At the end of the 11th century some portions of the Illyrian territory were taken by Venice and Hungary. About a century later the kingdom of Rascia was created, out of which that of Bosnia was formed in the 14th century. The country passing successively through the hands of the Venetians, Hungarians, and Turks, the name of Illyria gradually disappeared until 1809, when it was revived by the organization of the Illyrian provinces by Napoleon I., comprising a population of 1,275,000, and the territories of Carniola, Carinthia, Istria, part of Croatia, Dalmatia, Ragusa, and a military district. After the fall of Napoleon they were reunited to the Austrian government,

which in 1816 raised Illyria to the dignity of a kingdom. It lay between lat. 44° 43' and 46° 25' N., long. 13° 14' and 16° E., and was bounded N. by Austria proper and Styria, E. by Croatia, S. by the Adriatic, and W. by Italy and Tyrol; area, 11,000 sq. m.; pop. about 1,300,000. In 1850 a new division of territory took place, by which the kingdom of Illyria was abolished. The territory included in it now forms the duchies of Carinthia and Carniola, the county of Goritz and Gardiska, the margraviate of Istria, and the city of Trieste and its vicinity. The Illyrian language is one of the S. branches of the Slavic family of languages.

ILMONI, IMMANUEL, a Finnish physician, born in Nummis, March 29, 1797, died in Helsingfors, April 14, 1856. He studied in Abo and Stockholm, became professor of medicine in Helsingfors in 1826, improved his knowledge by extensive travel, and wrote many medical works, the most important of which is his *Bidrag till Nordens Sjukdoms Historia* ("Contributions to the Nosological History of the North," 3 vols., Helsingfors, 1846-'53; 4th vol. not completed).

ILOPANGO, a lake in the republic of San Salvador, Central America, 6 m. S. E. from the city of San Salvador. It is about 14 m. long by 6 broad, and is clearly of volcanic origin. On all sides it is surrounded by high, abrupt hills, composed of scoræ and volcanic stones. It receives no tributary streams, although it has a small outlet, flowing through a dark narrow ravine into the Rio Jiboa, near the base of the volcano of San Vicente. The surface of the water is not less than 1,200 feet below the level of the surrounding country. When the surface is ruffled by a breeze, it takes a singularly brilliant parrot-green color, and exhales a disagreeable sulphurous odor. Taken up, however, the water is clear, but not fit for use.

IMAM, IMAM, or IMAN, a Turkish religious official, who has the ordinary care of a mosque, calls the people to prayer, and reads prayers. He is elected by the people, and is ecclesiastically independent. The name Imam is also the title of the founders of the 4 principal Mohammedan sects.

IMFERDIS, ANDRÉ, a French author, born at Amberg, Puy-de-Dôme, about 1810. He was educated for the bar, and has officiated since 1848 as counsellor at the court of appeal of Algiers, in which capacity he conducted in 1857 the case of Capt. Doineau, accused of having murdered an Arab chieftain. He has written *Le dernier jour d'un suicidé* (2 ed., 1836), and several novels and poems; and more recently he has furnished several valuable works on the history of Auvergne, as *Histoire des guerres religieuses en Auvergne pendant les XVI^e et XVII^e siècles* (2d ed. enlarged, 1846), and *L'Auvergne historique depuis les Gaulois jusqu'au XVIII^e siècle* (1851).

IMMACULATE CONCEPTION, a doctrine of the Roman Catholic church which teaches that the virgin Mary was in her conception exempt from all stain of original sin. It was not defined as an article of faith until

Dec. 8, 1854. The formal statement of the doctrine is found in the constitution of Pope Pius IX., *Ineffabilis Deus*. The words of the decree are as follows: "We define the doctrine which holds the most blessed Virgin Mary in the first instant of her conception to have been preserved free from all stain of original sin, by the singular grace and privilege of Almighty God and through the merits of Jesus Christ the Saviour of the human race, to be a doctrine revealed by God, and therefore to be firmly and constantly held by all the faithful." This doctrine was long a subject of controversy in the Roman Catholic church. The feast of the conception was celebrated at a very early day in the East, and it is almost impossible to fix the precise date of its introduction in the West; it was probably during the 8th and 9th centuries. Its celebration was not universal, and the attempt to enforce it met with opposition. In the East there seems to have been no discussion, and the emperor Manuel Comnenus enforced its observance about the year 1150. A little before that time St. Bernard had violently reprobated the canons of Lyons because they established this festival without consulting the Roman see. He also appears among the most distinguished opponents of the doctrine. The question was then taken up by the great religious orders, and while the Franciscans arrayed themselves in defence of the immaculate conception, the Dominicans became its fierce adversaries. St. Thomas, following the opinions of his order, wrote against the doctrine, and his great opponent Scotus was equally strenuous in its favor. The Dominicans continued their opposition for several centuries. The university of Paris in 1387 condemned certain propositions of John de Montesano, a Dominican, in which the doctrine was denied, and in 1497 passed a decree that no one should be admitted to any academic honor who did not bind himself by oath to defend it. In 1439 the council of Basel, which was regarded as schismatic, declared the "belief of the immaculate conception of the Virgin to be conformable to the doctrine and devotion of the church, to the Catholic faith, right reason, and the Holy Scriptures, and to be held by all Catholics." The council of Trent, in its decree concerning original sin, expressly declared that it did not intend to include the immaculate Virgin, and ordered the decrees of Sixtus IV. to be observed. During all the controversy the holy see interfered only occasionally, but these interferences were successive steps toward the formal definition of the doctrine. Sixtus IV., in the apostolic letter entitled *Grave nimis*, published in 1480, imposes excommunication upon any one who should accuse of heresy either the advocates or the opponents of the immaculate conception, while at the same time he condemns all who affirm as the truth the opinion that the Blessed Virgin was conceived in sin. He also granted indulgence to those who should assist at mass or office on the feast of her conception. Pius V., in the bull 114, *Super Specu-*

lam, in 1570, prohibited the public discussion of the question, renewing also the decree of his predecessor. Paul V. in 1616 forbade any one to affirm by any public act whatever that the Virgin was conceived in sin, while he also prohibited the open condemnation of this opinion. Gregory XV. in 1622 prohibited either the public or private denial of the immaculate conception, allowing no discussion whatever on the subject except to the Dominicans, to whom an especial privilege was reserved. The office and mass of the conception were however made binding upon them as upon all Catholics. In 1661 Alexander VII., in the bull *Sollicitudo Omnium Ecclesiarum*, declares the opinion that the Virgin was conceived without original sin to be almost universal in the church. Therefore he renews the decrees of his predecessors, and commands that they be observed in favor of the feast and cultus of the conception. Moreover, he deprives of the faculty of teaching or preaching any one who should call into doubt or misinterpret the favor shown to this opinion by asserting any thing against it, or even by bringing forward arguments against it. After that time the congregation of rites repeatedly interposed its mandate in favor of the doctrine. The word immaculate was added in the office and mass of the conception, and its use made binding upon all priests, even those of the Dominican order. Pius IX. in the early part of his reign sent letters to all patriarchs and bishops, requesting their opinion upon the propriety of defining the doctrine; 620 bishops and archbishops gave their answers to the holy see, and of these only 4 were opposed to the definition on dogmatic grounds, and even these gave testimony that their clergy and people were united in the belief of the doctrine. When replies were received from nearly the whole Catholic episcopate, as many of the bishops as possible were invited to be present in Rome to assist at the solemn definition of the doctrine. This ceremony took place with great pomp in the basilica of St. Peter, in the presence of more than 300 archbishops, bishops, and prelates, on the feast of the immaculate conception, Dec. 8, 1854. The inauguration by the pope of the monument erected in honor of the immaculate conception took place in Rome in Sept. 1857.

IMMERMANN, KARL LEBRECHT, a German poet and novelist, born in Magdeburg, April 24, 1796, died in Düsseldorf, Aug. 25, 1840. He interrupted his studies at Halle to take part in the campaign of 1813. Returning to Halle, he opposed the liberal sentiments then manifested by the German youth, and wrote a pamphlet *Ueber die Streitigkeiten der Studierenden zu Halle* (Leipsic, 1817), which was publicly burned by the students at the festival of the Wartburg. He soon after received civil appointments, and in 1827 became councillor at Düsseldorf, where he undertook the management of the theatre, with the design of forming a model troop of actors and of reforming the stage. Among his best productions are the comedy *Das Auge der Liebe*,

the tragedy *Das Trauerspiel in Tirol*, the poem *Merlin*, and the romance *Die Epigonen*, an imitation of *Wilhelm Meister*. His collected works were published in 14 vols. (Düsseldorf, 1834-'43). His *Theaterbriefe* were edited by Gustav zu Puttitz and published in Berlin in 1851.—See Freiligrath, *Erinnerungen an Immermann* (Stuttgart, 1842).

IMOLA, INNOCENZIO DA, a Bolognese painter, born at Imola in the latter part of the 15th century, died about 1550. He was a pupil of Francia, and resided chiefly in Bologna, in the academy of which city his great painting of the archangel Michael subduing Satan, which was formerly in the church of San Michele in Bosco, is now preserved. In the latter part of his life he imitated Raphael, and some of his works have been mistaken for those of Raphael.

IMPALEMENT, a barbarous mode of execution by thrusting a stake through the victim's body and leaving him to perish. It was known to the Romans, but not much practised by them. The Turks, Persians, and other orientals employ it with frequency for the punishment of great criminals, especially for the assassins of rulers and for blasphemers. It is not unusual for persons impaled to linger for several days suffering intensely, especially from thirst. It is commonly asserted that a draught of water given to a person in this condition will cause immediate death.

IMPEACHMENT (Fr. *empêchement*, hindrance, obstruction), the accusation and prosecution, in a legislative body, of a person for treason or other high crimes. By the law of England, any member of the house of commons may impeach any other member of the house, or any lord of parliament, or indeed any other officer of the realm. Upon such impeachment being made, the house of commons, if they see fit, exhibit articles of impeachment before the house of lords, and appoint managers to sustain the charge and conduct the trial; and upon the trial, the same rules of evidence, in general, are in force as in trials in the ordinary courts of justice. This is a very solemn procedure, being no less than a prosecution before the supreme court of criminal jurisdiction for the whole realm, by the grand inquest thereof. It has been most frequently used against the king's ministers; and in order to take the trial from the power of the king, it is provided by law that the impeachment is not abated either by the prorogation or dissolution of parliament. The latest and best known cases are those of Warren Hastings (1788) and of Lord Melville (1805). In the United States, impeachment is a written charge and accusation by the house of representatives of the United States, made to the senate of the United States, against some person who is an officer thereof; or, in a state, it is such an accusation of an officer, by the representatives of the state, before the senate. The proceedings, rules, and practice in cases of impeachment in this country are borrowed from the common law of England, excepting so far as they are affected by

the constitution or statutes of the United States, or of the several states. The constitution of the United States declares (art. i. sec. 2) that the house of representatives shall have the sole power of impeachment, and (art. i. sec. 3) that the senate shall have the sole power to try all impeachments. By art. ii. sec. 4, the persons made liable to impeachment are the president, the vice-president, and all civil officers of the United States. The offences for which a guilty person may be impeached are (art. ii. sec. 4) "treason, bribery, and other high crimes and misdemeanors." Art. iii. sec. 3, declares that "Treason against the United States shall consist only in levying war against them, or in adhering to their enemies, giving them aid and comfort." This would seem to be a precise definition of treason; but the house and senate would still be free to determine what is meant by "bribery," and what offences come within the words, "other high crimes and misdemeanors." They would probably be guided, but not governed, by the rules of the common law and the practice of parliament.—The method of procedure, both in the United States and in a state, is substantially as follows. A resolution is offered by some member of the house, charging the party to be impeached with his supposed offence, and either demanding at once his impeachment, or, what is more common, providing for a committee of inquiry. If the resolution is passed by the house, and if a committee of inquiry be ordered who report adversely to the accused, and in favor of an impeachment, and their report is adopted, a committee (the same or another) is instructed to impeach the accused before the senate, and demand that that body make due provision for the trial, and inform the senate that articles of impeachment will be prepared by the house and exhibited before the senate. The same or another committee is intrusted to prepare articles of impeachment, which, being reported to the house, and approved by them, are transmitted to the senate, by a committee who are appointed to conduct the trial on the part of the house, and who are usually styled the managers of the impeachment. Due process summoning the accused then issues from the senate, and is served by their sergeant-at-arms; and on the day therein appointed, the senate resolves itself into a court of impeachment, all the senators being sworn to do justice according to the constitution and the laws. The person thus impeached is then called upon to appear and answer. If he makes default, the senate proceeds *ex parte*. If he appears and denies the charges, and puts himself on trial (and he may appear by attorney), an issue is formed, and a time is appointed for the trial, which thereafter proceeds according to law and usage, and much in the same way as in common judicial trials. If any questions arise among the senators, who now act as judges, they are considered with closed doors, and are decided by yeas and nays, and only the decision is made public. Art. i. sec. 2,

of the constitution of the United States, provides that no person shall be convicted without the concurrence of two thirds of the members.

IMPROVISATORE, *fem.* **IMPROVISATRICE** (*It. improvvisatore and improvvisatrice*), a composer of extempore rhymes. Probably most lyric effusions, in the infancy of poetry, were improvised to the accompaniment of the harp or other musical instrument. The troubadours, like the British bards, sometimes wove their lays on the inspiration of the moment, and they brought the art into Italy, where the easy rhythm of the language caused it to be much cultivated. We find, however, little or no record of improvisatori, specially ranking as such, until about the commencement of the 16th century. From that date to the present the succession has been uninterrupted. The most noted Italian poets of this class are Serafino d'Aquila, who died in 1500; Bernardo Accoti, better known as "the only" Aretino; Cristoforo the Florentine, surnamed the *altissimo*; Andrea Marone and Querno, who made Latin verses for Leo X.; Nicolo Leoniceo, Giammario Filelso, Pamfilo Saffi, Ippolito di Ferrara; Battista Strozzi, Pero, Nicolo Franciotti, Cesare da Fano; Cristoforo Sordi, Aurelio and Raffaello Brandolini, all three blind; Silvio Antoniano, *il poetino*; Perfetti di Sienna, who was crowned with laurel; Metastasio when a boy; and in the present century Francesco Gianni, who was improvisatore to Napoleon I., Pistrucchi, the duke di Mollo, the abbé Serio, Baldinotti Sestini, Tommaso Sgricci (who received from the grand duke of Tuscany 2,000 francs for his improvisations on Mary Stuart, and a pension of 2,400 francs), Luigi Ciccioni, Bindocci, and many others. Among Italian women distinguished in the art were Cecilia Micheli, Giovanna di Santi, Barbara of Coreggio, Teresa Bandinelli of Lucca, and especially Corilla or Maddalena Moralli Fernandez, who died in 1800, and Rosa Taddei, born in 1801. Pradell in France, who died in 1857, was a remarkable improvisatore.

INACHUS, a mythical king, represented as the first ruler and priest of Argos, which, as well as the river Inachus, was often called after him. When Neptune and Juno contended for the possession of that country, he decided in favor of the latter, and thus incurred the anger of Neptune, who caused a dearth of water in his dominions.

INCA, a Peruvian, or rather Quichua title, signifying chief, applied to the imperial head of the Peruvian empire, and also the governing caste or race from which he sprung, and which had a prescriptive right to the highest sacerdotal and civil dignities of the empire. To understand the powers and position of the incas, it should be premised that, although the Peruvian empire, which extended from the equator S. over 37 degrees of latitude, and embraced not only the western slope of the Andes, but included that stupendous mountain chain, and spread down its eastern declivities to the broad alluvions of the Amazon and Orinoco, was un-

der a single system of laws, and formed politically a well ordered nation, yet its people were not of a single stock, but an aggregation of distinct families, with strongly marked physical differences. They once existed as separate tribes or nations, but had been reduced to the relations in which they were found at the time of the conquest by an astute system of policy, which, in its scope and power, is hardly paralleled by any other known to history. Modern research has grouped these various families under 3 grand divisions, viz.: the Aymares, Chinchas, and Huancas, of which the Aymares were the dominant stock. They occupied the heights of Peru and Bolivia, elevated 12,000 feet above the sea, and seem to have made the first and most decided advances in the arts and institutions of civilization. The Chinchas occupied the region lying between the Cordilleras and the Pacific; and the Huancas, who in respect of numbers exceeded either of the other races, were spread over the region lying between the Cordilleras and the Andes, between the Chinchas and Aymares. They were the first subjected to the dominion of the latter; and the history of Peru is the history of the Aymares—the conquerors, rulers, and civilizers of the other stocks; and of this race the family of the incas was the head and directing intelligence. According to the traditions of the Aymares, there was a time when they were broken up into independent and warring tribes, sunk in the lowest depths of barbarism. From this condition they were rescued by their tutelary divinity the sun, who sent down his own children to reform and instruct them. These were Manco Capac and his sister and wife Mama Oello Huaco, who made their appearance on an island in Lake Titicaca, whence, under divine instruction, they journeyed northward to the spot where the city of Cuzco, which afterward became the capital of the incas, now stands. Here they collected together the neighboring savage hordes, and while Manco Capac instructed the men in agriculture and the arts, and inspired them with ideas of social and civil organization, Mama Oello taught the women to spin and weave, and inculcated modesty, grace, and the domestic virtues. From this celestial pair the incas claimed their descent, in virtue of which they were the high priests of religion and the heads of the state. In this tradition we trace only another version of the story of their civilization common to all primitive nations, and that imposture of a celestial relationship whereby designing rulers and cunning priests have sought to secure their ascendancy among men. Manco Capac is the almost exact counterpart of the Chinese Fohi, the Hindoo Buddha, the terrestrial Osiris of Egypt, the Quetzalcoatl of Mexico, and Votan of Central America. At first the rule of Manco Capac was limited to a few leagues around Cuzco, but by alliance and conquest it was gradually extended, until under Huayna Capac it spread over nearly 30 degrees of latitude, and reached from the Pacific to

the pampas of Tucuman, and to the Ucayali and Marañon, and embraced 10,000,000 inhabitants. Aside, however, from all traditions, there are monumental evidences that, anterior to the foundation of the Peruvian empire, there existed on the islands and shores of Lake Titicaca a people of relatively high civilization, the story of whose migration to the northward is probably preserved, in a figurative form, in that of Manco Capac and his sister; and it may safely be assumed that this people, in their new relationships, and in virtue of their intelligence, arrogated to themselves a superiority over the tribes which they brought under their control, and founded an exclusive and aristocratic caste, the inca race. We have no means of fixing the date of the appearance of the first inca; for notwithstanding their advance in other respects, the Peruvians never developed the art of writing. This period has nevertheless been placed by careful students about 4 centuries before the arrival of the Spaniards, or in 1021; but other less critical writers have not hesitated to place the advent of Manco Capac within 500 years of the received era of the flood.—The authority of the ruling inca was absolute; his will was the supreme law; he had no council of state, no ministers, nor did he admit any institution limiting the royal prerogative; and although he sometimes consulted with his aged and more experienced subjects, it was from considerations of utility, and not in conformity with any organic law of the empire. Considered as the son of the sun, and descendant in a right line from Manco Capac, he was also the high priest and oracle of religion. Uniting the legislative and executive power, chief captain in war, absolute sovereign in peace, and the venerated pontiff of religion, he realized in himself the union of pope and emperor. Clothed with such dignity, he received the blindest obedience from his subjects; his person was sacred; his body after death was regarded with pious veneration, and was the object of divine honors. The highest officers of the land could not appear shod in his presence, and, when they had their audiences, were obliged to come bearing a load on their shoulders as a sign of submissioin. The people themselves were not allowed even to approach the street in which the royal palace was situated, except with bare feet and uncovered heads. The inca possessed an unlimited number of concubines, in some instances exceeding 700, but he had only one legitimate wife called *coya*, whose eldest son was heir to the throne. By a singular rule, the *coya* was required to be the sister of the inca. This incest, by the concentration of blood in a single line, gave to the imperial family a peculiar physiognomy, which contributed still further to impress the people with the idea of its distinct and supernatural origin. The youths of royal blood were carefully educated by the *amautes* or wise men, and prepared for the *huaracu*, an order analogous to that of knighthood in the middle ages. After

their initiation they were presented to the inca, who bored their ears and inserted in them golden rings, which were increased in size as they advanced in rank, until the distention of the cartilage became a positive deformity; whence the Spaniards gave the name of *orejones*, "big-ears," to those thus decorated. Until his investiture with the honors of the *huaracu* the heir of the throne was in nowise distinguished from his comrades; but then he was further invested with a peculiar head dress, and afterward recognized everywhere as the future sovereign of the empire.—Nothing could be more complete than the civil organization of the incas. The imperial city of Cuzco was made a microcosm of the empire. In common with the country at large, it was divided into 4 quarters, N., S., E., and W. Its inhabitants were drawn from each of these divisions, and required to take up their abode in corresponding quarters of the city. Each of the 4 grand divisions of the empire was under the government of a viceroy, and its inhabitants were divided into groups of 10,000 souls, each with its native chief and inca governor. These groups were still further subdivided into thousands, hundreds, and tens, with their appropriate officers, who were held in strict accountability to the officers next in rank above them. The right of every individual to a portion of the earth, sufficient to support life, was as clearly recognized as his right to breathe the air of heaven. All lands capable of being cultivated were divided into 3 parts; one was devoted to the sun, or the support of religion; another to the inca; and the third to the people at large. Each Peruvian received a portion of land called a *topu*, which was sufficient to produce the maize necessary for the support of a man and his wife without children. On the birth of a son, he received another *topu*, and on the birth of a daughter half a *topu*. On the death of an individual his land reverted to the state for allotment. Children were obliged to follow the professions of their fathers, and were not allowed to receive an education superior to their positions in life. No one could change his residence without permission of his superior.—The inca code was simple and its penalties were severe. "Tell no lies," "Do not kill," were the concise terms in which the laws were promulgated. Idleness was severely punished, and homicides and robbers were put to death. But the severest penalties were inflicted upon those who sinned against religion or the sacred majesty of the inca. They were not only burned or buried alive with their families and friends, but their houses were levelled, the trees on their lands cut down, and the lands themselves made desolate. The penalties visited on provinces which rebelled against the inca were scarcely less terrible, involving the slaughter of all its males, old and young.—But it was perhaps in their system of conquest that the incas exhibited their greatest wisdom and profoundest policy. Their first effort after reducing a nation or province

was to mould its people into their own system, and infuse among them their own spirit. In doing this they were careful to give no rude shock to their prejudices. The idols of the conquered people were brought, with every demonstration of respect, to Cuzco. Thither also were summoned the conquered chiefs with their families, where they were treated with the greatest distinction and kindness; and after becoming sufficiently imbued with the institutions of the inca and impressed with his power, they were often reinstated at the head of their people as officers of the empire. The language of the empire was taught to the children of all these vassals, and made to supplant that of their fathers. To secure the new acquisitions from rebellion, large colonies of from 8,000 to 10,000 individuals, from tried and faithful provinces, were settled in the subjugated territory, in place of an equal number removed to make place for them to other parts of the empire; and to reconcile these colonists to their new conditions, they were invested with many privileges, and treated with marked partiality. Thus by a complex system of liberality and severity, persuasion and force, the inca empire was not only extended, but the conquered nations effectually amalgamated and moulded into a compact whole.—But while the civil and social systems developed by the incas were well adapted to physical amelioration of the people, they were not suited to their intellectual development. Not content with concentrating in themselves the functions of government and religion, the inca stock monopolized also the advantages of instruction and all that there was of science. The people were taught to regard them with reverence as the sons of heaven, the sources of power, and the fountains of intelligence. Destitute however of a written language, the incas themselves were unable to perpetuate ideas and accumulate knowledge. Their wisdom was chiefly political and practical. Territorial extension being their leading object, military science received their closest attention. But none were highly educated, even in this department, except the young men of the privileged race. When the reigning inca died, or, as it was termed, was “called home to the mansion of his father, the sun,” his body was embalmed and invested with royal robes, seated in a chair of gold, in the great temple of the sun in Cuzco. His obsequies were performed with the greatest pomp, and a large number of his attendants and concubines, sometimes amounting to several hundreds, were made to die with him, in order to bear him company in his new state of existence.—Altogether, it may be said, the incas originated civil and social institutions of much perfection, possessing, in the language of Prescott, “an indefinite power of expansion, and suited to the most flourishing condition of the empire, as well as to its infant fortunes.”

INCENSE. See FRANKINCENSE.

INCEST, carnal commerce between a man and woman who are related to each other in

any of the degrees within which marriage is prohibited by law. It rests with positive law to determine these degrees; for although marriages between those nearly related are clearly opposed to the law of nature, yet it is difficult to fix the point at which they cease to be so. With rare exceptions, all civilized communities have agreed in regarding marriage between those lineally related as unnatural and offensive; but beyond this point rules and opinions have been various. Of the writers who have argued this question, Mr. Taylor in his work upon the Roman law is perhaps most elaborate and ingenious. He holds that it is not with the case of lineal relationship alone that the law of nature is concerned; that, in proportion as other relatives approach in nearness to the paternal or fraternal relation, marriages between them are to be more or less severely denounced; and finally, that the first point at which intermarriage between kindred is consistent with propriety is that fixed by the civil law, to wit, the fourth degree, according to the computation of that system. By this rule the Roman law permitted the marriage of the children of brothers and sisters (Inst. i. 10); so did the Levitical law (Levit. xviii. 6–20; Numb. xxxvi. 10, 11); and so did the church of Rome until the time of Pope Alexander II., when a new mode of computation was devised, by which second and third cousins were brought within the prohibited degrees. The rule of the Roman law is generally observed also in the positive law systems of modern states. In England and the United States the marriage of cousins is certainly lawful, and is not uncommon in practice. But much attention has been paid to the subject of late, and powerful arguments, resting upon unquestionable and significant facts, have been urged against the expediency, to say no more, of marriages between blood relations. It seems to be established as a general, if not universal rule, that such relation between parents, especially if it be as near as that of first cousins, may entail upon the offspring mischievous consequences, bodily or mental, or both; and the ill effect of what is called “breeding in” among animals seems to lead to the conclusion that this is a universal law.

INCHBALD, ELIZABETH, an English actress, dramatist, and novelist, born at Standingfield, near Bury St. Edmund's, Suffolk, in 1753, died in Kensington, Aug. 1, 1821. She was the daughter of a farmer named Simpson, who died when she was in her 16th year. She then went to London and sought an engagement at the theatres, but without success. She finally obtained a place at a county theatre, and soon after married Mr. Inchbald, a comedian, much her senior in age. On the stage her beauty and abilities commanded success. After some years of uninterrupted happiness, her husband died, and a few years later, in 1789, she retired from the boards and devoted herself to literature. In this new pursuit she was equally successful. She wrote in all 19 plays, for which she re-

ceived various sums from £100 to £700 each. She also edited the "British Theatre," a collection of plays (47 vols., London, 1808-'15). A few of her own pieces, as the "Wedding Day" and "Wives as They Are," still hold their place on the English stage. Her novels, "A Simple Story" and "Nature and Art," once enjoyed even a higher popularity than her dramatic writings, and are still admired. She died possessed of £6,000, which she bequeathed chiefly to Roman Catholic charities. She wrote an autobiography which she caused to be destroyed. The "Memoirs of Mrs. Inchbald" (2 vols. 8vo., London, 1833) was compiled from her journal, covering a period of 50 years.

INCLEDON, BENJAMIN CHARLES, an English singer, born at St. Keverne, Cornwall, in 1764, died in Worcester, Feb. 11, 1826. He acquired his earliest musical education in the choir of Exeter cathedral, and subsequently, while serving in the navy, by his vocal abilities attracted the notice of Lord Hervey and other officers, who persuaded him to go upon the stage. He attracted little attention at first; but having been instructed by Rauzzini at Bath, he made his debut in London in 1790 in the "Poor Gentleman," with great success, and for 25 years remained unrivalled as a ballad singer. His voice was a fine tenor, and the manly grace with which he rendered "Black-Eyed Susan," "Wapping Old Stairs," "The Storm," and other old English songs, has never been surpassed. His favorite part upon the stage was "Macheath," which, it was said, he would have risen from his bed at midnight to perform. In 1817 he made a musical tour in the United States, but his voice was beginning to yield to age and an irregular course of living, and the enterprise was not very successful.

INCLINED PLANE. See MECHANICS.

INCOMBUSTIBLE CLOTH, a fabric woven with threads of asbestos, and described in the article on that substance. Cloth of ordinary materials is rendered partially incombustible by the application of certain saline solutions, as of alum, borax, phosphate of soda, &c., in combination with starch. These cannot prevent the decomposition of the material by heat, but their action is to check the rapid spreading of flame and limit its effect to the point of the fabric which it touches. They are therefore called anti-flammable salts. The method of applying them is to soak the fabrics in their solutions. Curtains of theatres and of beds may thus be protected, and paper hangings and scenery by using a strong size instead of starch. The weight and stiffness imparted by the application render it objectionable for clothing. MM. Dœbereiner and Elsner, in the *Répertoire de chimie*, remark that fine and light tissues cannot be treated by the same agents employed for wood and coarse stuffs. Borax renders fine textile fabrics stiff; it causes dust, and will swell out under the smoothing iron, and moreover weakens the fibres; alum also produces the same effects. Soluble glass stiffens the

stuff and deprives it of elasticity and tenacity. Phosphate of ammonia, obtained by saturating the biphosphate of lime with liquid ammonia, is highly recommended on many accounts, but it is liable to decompose under the iron of the laundress, impeding the operation of ironing; and it is also an expensive salt in the quantities required. Sulphate of ammonia is advantageously substituted for it on the score of cost, being worth only about $\frac{1}{4}$ as much, but this also is liable to decompose by ironing; and both are dissolved out in washing. In consequence of the numerous accidents reported in the London papers from light dresses and curtains taking fire, a commission was appointed by Professor Graham, master of the mint, by desire of her majesty, in 1859, to investigate the most efficient methods of guarding against these disasters. Messrs. Versmann and Oppenheim undertook this charge, and in the laboratory, the laundry, and various muslin manufactories, the effects of more than 40 different salts were tested by them. In the experiments with sulphate of ammonia whole pieces of muslin (8 to 16 yards long) were dipped into a solution containing 10 per cent. of this salt, and dried in the hydro-extractor. The preparation had no effect upon the colors, except to render madder purple pale; and the results with these and with several dresses treated with the same salt were very satisfactory. Phosphate of ammonia gave a chalky finish, but with the sulphate of ammonia the finish was transparent. Other pieces prepared with the latter salt were shown in the exhibition of inventions of the society of arts, which after a period of 6 months were unaffected in color or texture. On account of the small proportion of this salt required, the objectionable effect of the hot iron is not so serious; it cannot, however, be entirely avoided. At the Kirkton bleach works, Neilston, sulphate of ammonia has been applied upon a large scale for rendering muslins non-inflammable, and pieces of the finest quality are not injured by it. The salt finally selected as the most efficient in every respect, and the one now in constant use in her majesty's laundry, is the tungstate of soda. Without injuring the strength or appearance of the fabric, it allows the hot iron to pass smoothly over the surface of the prepared material, and affords a perfect guaranty against the effects of flame, and is moreover not easily removed by washing. The best method of using it is to dilute a concentrated neutral solution of tungstate of soda with water, till it is reduced to 28° Twaddell, and then add 3 per cent. of phosphate of soda, the effect of which is to keep the salt from decomposing and forming a bitungstate, which tends to separate by crystallizing. The increase of weight in muslin, not starched, prepared with a solution of 10 per cent. of tungstate of soda, is found to be 27 per cent.; and with one of 7 per cent. of sulphate of ammonia, about 18 per cent. The report of Messrs. Versmann and Oppenheim was read before the British association at Aberdeen, Sept.

15, 1859. See "Journal of the Society of Arts," Dec. 30, 1859.

INCUBATION. See BIRDS, vol. iii. p. 281.

INCUNABULA (Lat., cradle), in bibliography, books printed prior to about 1500 (according to Panzer, prior to 1536), of which there are estimated to be about 15,000. The fullest account of them is found in Ludwig Hain's *Repertorium Bibliographicum, in quo Libri Omnes ab Arte Typographica inventa usque ad Annum MD. Typis expressi Ordine Alphabetico recensentur* (2 vols., Stuttgart, 1826-'38).

INDEPENDENCE, a N. co. of Arkansas, bounded E. by Black river, and traversed from N. W. to S. E. by White river; area, 1,050 sq. m.; pop. in 1854, 8,625, of whom 1,051 were slaves. It has a very uneven surface, well wooded with pine and other timber. The soil is fertile, and the productions in 1854 were 501,750 bushels of Indian corn, 15,490 of wheat, 57,399 of oats, and 1,541 bales of cotton. Black marble is found here. Capital, Batesville.

INDEPENDENCE, the capital of Jackson co., Mo., situated near the W. frontier of the state, 5 m. S. from the Missouri river, and 165 m. W. N. W. from Jefferson City; pop. in 1853, about 2,500. It contains several churches, newspaper offices, and hotels, and derives a profitable trade from its position as an entrepot between New Mexico and Utah and the eastern states, and a place of outfit for emigrant trains to Oregon and California. A railroad not yet finished is to connect it with Jefferson City and Kansas City. The Mormons regard this place and the surrounding country as the destined seat of the saints, and as the holy land where they will at no distant day be gathered. They settled there in 1837, but were expelled by the people of Missouri, and took refuge in Illinois and afterward in Utah. But to this day they profess their expectation of eventually settling at Independence.

INDEPENDENTS, a Protestant sect holding Congregationalist views, which arose in England in the 16th century. The sect owed its origin in 1586 to Robert Brown, an English clergyman, who terminated a long life in Northampton gaol in 1630. They were at first called Brownists, but their discipline having been modified by John Robinson and Henry Jacob, who had been connected with him, they took the name of Independents, and rapidly spread over England. From Holland a body of them carried their tenets to America in 1620. They flourished in England during the commonwealth, Cromwell himself being in their communion; but on the restoration the act of uniformity, passed in 1662, excluded 1,900 of their ministers from office. The act of toleration, in 1689, freed dissenters from the pains and penalties imposed on the exercise of their worship, and in 1691 a union was effected between the English Presbyterians and Independents. It was not, however, till the repeal of the test and corporation acts in 1828, that the English Independents, with other dissenters,

were freed from all civil disabilities. (See CONGREGATIONALISM, vol. v. pp. 609-'10.)

INDEX LIBRORUM PROHIBITORUM (Lat.), a catalogue of the books which Roman Catholic discipline forbids its followers to read, as prejudicial to faith and good morals. It is prepared by a congregation of cardinals and theologians at Rome designed for this special purpose. Such prohibitions appear in the early history of the church, the council of Carthage (400) having forbidden the reading of pagan authors. In 1546 the university of Louvain prepared a list of the works that were deemed pernicious, and this example was soon followed at Venice, Paris, Cologne, and other cities. In 1557 Pope Paul IV. caused a catalogue to be prepared by the inquisition at Rome, which is usually called the first Roman Catholic index. It was enlarged and reduced to a regular form by a commission of the council of Trent, whose index appeared with the sanction of Pius IV. in 1564. It was again enlarged by Clement VIII. in 1595. The congregation of the index was instituted at Rome by Sixtus V., and was established as it now exists by Pius V. The 3 portions of the index contain respectively all books by heretics which involve errors or treat expressly of religion, all books by Catholics opposed to the Catholic faith and to good morals, and all anonymous works involving pernicious doctrines. Bishops have the right to permit educated persons to read the prohibited books. Beside the *Index Librorum Prohibitorum*, there is the *Index Expurgatorius* (or *Librorum Expurgandorum*), containing a list of books prohibited until certain passages be eliminated from them. In Austria and some other Catholic countries, the index is authoritative only when confirmed by the civil government. The latest edition, published in 1819, has since been much enlarged.

INDIA. See EAST INDIES, and HINDOSTAN.

INDIA RUBBER. See CAOUTCHOUC.

INDIAN CORN. See MAIZE.

INDIAN LANGUAGES, ASIATIC. India this side of the Ganges was divided by the Vindhya range of mountains, in the earliest historic times, into two areas, as regards its ethnological and glossological relations. The northern region comprehended the Aryan stock, whose branches were spread westward under the name of the Indo-European family of languages. The southern portion consisted of the autochthonic race with their idioms. At present it is also divided into two areas by a limit which wavers between two lines running from W. to E., the one from near Bombay to Ganjam, the other from near Goa to Chicacole. The city of Beeder, lat. 19° N., long. 78° E., is the point at which several of its modern languages meet. Uttaradis (northern region) was the land of the Aryans who had come from the West (see SANSKRIT), and who, after having there developed their institutions (see BRAHMA), invaded the Dravida-desa (Deccan), or southern country, and Ceylon. Sanscrit writings enumerate a twofold quinary stock

of Brahmins, viz.: the Pancha-Gauda (5 districts) in the N. and E., and the Pancha-Dravida (5 southern). Sanscrit grammarians considered all Dravidan languages as Pracrit (vulgar, provincial dialect) or low Sanscrit, corrupted by indigenous languages; but Ellis proved (1820) that they constitute a family of their own, which has been affected by both the Sanscrit and the Pracrit of the north. All indigenous Dravidan tongues are commonly called Pracrit; although the genuine Pracrit coexisted with the Sanscrit, and has its own literature of books, as well as of inscriptions of the 3d century B. C. The Indian languages of Asia comprise 3 groups, Sanscritoid, Arabized Pracritoid, and Dravidan.

A. On the Indian languages of Sanscrit origin materials may be found in catalogues of oriental books by Parbury, Allen, Howell, Stuart, and others; in McKenzie's collection of manuscripts, &c., Vans Kennedy's researches (not always trustworthy), Carl Ritter's geography, and many works on ethnology. These languages are the following 24, according to Lassen. I. In the N. E. of India: 1. The Assamese, on the Brahmapootra, akin to Hindostanee, in two branches, the Decan-göl (southern) and Uttar-göl (northern). The title of the rajah of old was *dshaya-dhcadja-sinha* (victory-flag-lion); and he also called himself *svergi* (heavenly), the inhabitants being Cultans, those of the north Miro-metshmi and Dereng; also rude mountain tribes, Semle and Nanak, whose language differs from the Assamese. 2. Bengalee (see BENGALEE). 3. Maithilee or Tirhutia, Tirabhueti, between the Coosy and Gunduck, tributaries of the Ganges, and S. of the mountains of Nepal, akin to the Bengalee, with similar letters. 4. Orissan (Odhradesa, Uriya, Autcali), S. W. of Bengal, around Cuttack on the Mahanuddy; it resembles the Bengalee. There is a grammar of it by Sutton (1841). II. At the foot of the Himalaya: 5. Nepaulese; the people of some parts of Nepal are very skilful in writing. 6. Kosalese, N. of Oude, about Almora. 7. Dogusee, between Almora and Cashmere. 8. Cashmorian, resembling the Mahratta tongue. III. In the N. W. regions: 9. Punjaubee, the idiom of Lahore; it possesses *kheals* and *teppas* (vocal music), and is employed in the sacred books of the Sikhs (learners, scholars; from Sanscrit *sikshā*, learning, and one of the 6 sciences attached to the Vedas), in letters called *guru-mukhi*, a corrupt Devanagari. This idiom has only 2 genders, no dual, and has altered many Sanscrit significations of words. There are grammars by W. Carey (Serampore, 1812) and Leach (Bombay, 1838), and a dictionary by Starkey (Calcutta, 1850). 10. Mooltancee, or Vuchee, on the middle Indus, W. of the preceding, formerly spoken by Rajpoots and Jauts. This, as well as the Punjaubee, contains many Persian words and phrases. 11. Sindhee, on the lower Indus, and about its mouths, in two dialects. It is also called Tatta, from Samudratatha (sea shore). There is a grammar by W. H. Wathen in the "Journal of the Asiatic So-

ciety" (1837), and a dictionary by Stack (Bombay, 1849). IV. On the W. coast of Hindostan: 12. Cutchee (Sanskrit *catchha*, watery, marshy), on the peninsular projection W. of the following; also spoken by Banshans out of India. 13. Guzeratee (Sanskrit *gurdijara*, musical, and *rāshtra*, country), in the peninsula of Guzerat, on the islands of Diu, Salsette, and Bombay, on the coasts opposite to them, and on the lower course of the Nerbudda. It is spoken by the Parsees in the cities, where it is much contaminated by Malebaric and other languages, owing to the extent of their commerce. There is a grammar by Dr. Robert Drummond (Bombay, 1808), and a lexicon by Mirza Mohammed Kazim (Bombay, 1846). 14. Concanee, on the low shores from Bombay to Goa, and in the parallel Ghauts, where it is called Ballagate. It is scarcely more than a dialect of the Mahrattée. S. of it is the Tulava, a Dravidan tongue. V. In the interior, *i. e.*, in Rajpootana: 15. Bikanee-ree. 16. Marvarree. 17. Jeypoorree. 18. Udaya-poorree. 19. Haroottee, formerly Sarasvatee, a Pracrit dialect. 20. Vraja-bhasha (or Brajabhakha, or merely Bridj, cow-pen language), in the Doab (between the Ganges and Jumna), in the province of Agra. It is the offspring of the Saurasenee Pracrit dialect, abounds in Sanscrit words, and has produced the Hindee. A work on the general principles of its inflections has been published by Shri Lullu Lal-kavi (Calcutta, 1811). 21. Malavee, on the table-land of Malwah. 22. Bandelakhandee, in Bundelcund. 23. Magadhee, in Bahar. VI. S. of the Vindhya range: 24. Maharashtree (great country's tongue), or Mahrattée, extending with varying breadth from Bejapoor and Oojein eastward, or between the Kistnah and Nerbudda, to the mountains that separate the interior from Bahar, Orissa, and Bengal; spoken by about 6,000,000 persons. This language originated in the north of India, and was preserved by the Vedic doctrine; while with the restoration of Brahminism by Sevajee (17th century) the southern Hindostanee was adopted by his followers. It is a harsh, dull-sounding, grave idiom, with mutilated Sanscrit words and flexions (though less so than the Bengalee), many Persian substantives, and some autochthonic remains, rich in cerebral sounds. Particles and auxiliary words supply the place of grammatical forms. Though its syntax is like that of Hindostanee, its derivations are more logical and from its own primitives. Some of its many dialects are the Bejapoorree and Uadée in Malwah, Desh in the Deccan, Sataree (a mixture of all), &c. Its scanty literature is of two kinds: Pracritic, in versions from Sanscrit, and the modern, in versions from English, &c. There are grammars of the Mahrattée by W. Carey (Serampore, 1808), R. Drummond (Bombay, 1808), J. R. Ballantyne (Edinburgh, 1839), T. Stevenson (Bombay, 1843), and one in Portuguese (Rome, 1778, and Lisbon, 1805); and dictionaries by J. T. Molesworth, T. and G. Candy (Bombay, 1831, 1849), Vans Kennedy

(1834), and Mahratta-Kosh by a Pundit. It has two kinds of letters: the *balbodh* (balaband-ic), a modified Devanagari, for sacred and serious treatises, and the *modi* (*mur*) for common purposes; the alphabet consists of 44 characters. B. Before the Mohammedan invasion the district of Vraja, around the city of Agra, and the poetic region of Muttra, surpassed all others in elegance of diction. After these, Kasi (now Benares) and Allahabad also became celebrated for their idiom, which eventually became the Hindee, retaining many Sanscrit words unaltered, others stripped of the final vowels, others syncopeated, and most changed by metaphony. This language had 3 dialects: *a*, the Khari-boli (pure language) or Fenth, in Delhi, Agra, and especially at Patna; *b*, the Des-bhasha (country speech); and *c*, the Pâtbi-bhasha (oriental tongue), in Oude and Benares. It extended over the whole north of India in the 9th century, and may be regarded as the language of the Indian middle age, being thus the connecting link between the ancient pure Aryan and the Hindostanee. It is often confounded with the ancient Pracrit. Its last form, before it was merged into Hindostanee, is, as we have said above, the Hindee or Hinduee, which has a less admixture of Arabic and Persian than the following. In its older form it has 4 masculine and as many feminine declensions; it has 6 tenses, and denotes the persons of verbs by preceding pronouns. Colebrooke derived the Hindostanee from the idiom of the once powerful Kanyacubyas (the people of Kanoje), which was identical with the Vraja-bhasha. The Hindostanee is not limited to any particular district; for it is spoken by all Mussulmans in India and by very many Hindoos, by all well informed persons in addition to the local vernacular tongues, especially in the north and centre of Hindostan, most particularly at Delhi, Agra, Lucknow, Allahabad, and in many parts of the Deccan. It is known from the Indus to the Ganges, from Bokhara and Thibet to Cape Comorin. It is sporadically known out of India, as for instance in Aracan, in the Maldives and Laccadive islands, in many parts of the Indian archipelago, and even at Mecca, as a sort of *lingua franca*. The Hindostanee may be compared to the French in its mode of extension; and as it is understood by almost 100,000,000 people, it is second only to the Chinese in extent. It is less known to the country people, especially in the Dravidan area, than to soldiers, merchants, and travellers. The Malabars call it Tuluk (proud, from the Moguls), and the Portuguese named it *lingua dos Moros*, as they applied the term Moor indiscriminately to Arabs, Persians, Mongols, and Turks. It arose by the admixture of words and phrases taken from the tongues of those Mohammedans with the Aryan idioms, in consequence of the invasion of the country by the Ghuznevide sultan Mahmood (997-1028), then of the establishment of Behran at Lahore (1145), of Turkish dynasties at Delhi, &c. It was much cultivated under the munifi-

cent Great Mogul Akbar (1558-1605), under his son Jehanghir (1605-27), under Aurungzebe (1658-1707), and Shah Allum, who had made it their court language in place of the Persian. It is the heir of the Sanscrit in literature; it was made the official language of the British possessions in 1835, and was taught at the civil college of Haileybury, as it is at the military institution at Addiscombe, in England, and in the universities of London, Paris, &c. The Hindostanee consists of two dialects, viz.: 1, the northern or Ordu-zuban (Turkish, camp language), purest at Delhi, and, since the fall of the Mogul empire, at Lucknow; 2, the Dakhnee (southern) or Gudjree (market) of Hyderabad and other courts, with Dravidan words. The so called Moorish is a jargon composed of Hindostanee with words and phrases taken from many other languages, especially from Portuguese; a sort of *lingua franca*, spoken by the rabble in seaports, &c., and confounded by Lebedeff (1801), Hadley (1809), and others with the Ordu. The Hindostanee is written either in the Devanagari (which is preferred by Brahmans), with some modifications, the 32 letters of the Arabo-Persian also modified by ligatures, &c., in order to represent 49 sounds (8 vowels, 2 diphthongs, *ai* and *au*, 3 semi-vowels, *h*, *y*, *o*, and 36 consonants). This language employs sometimes the Arabic article *el*, but more frequently none, as *beta*, son; *mard*, man, &c. Declension is twofold, either by inflexion or with prepositions or postpositions; denoting (beside our cases) locative, social, instrumental, causative, and communicative relations, &c. The 4 declensions, reducible to 2, are: *a*. *Beta*, Lat. *filius*; *beteka* (*ke* or *ki*), *filii*; *beteko*, *filio* and *filium*; *betere*, *o filii*; *betese*, *cum filio*; *betekune*, *pro filio*; *betesibi*, *a filio*; *betepur*, *apud filium*; *betemen*, *in filio*, and so on by postpositions, as *pas*, *prope*; *mare*, *per*, &c.; plural: *bete*, *filii*; *beto*, *o filii*; and *beton* with all postpositions for all other cases or relations. *b*. Nouns ending with a consonant are declined without a suffixed vowel, unless in the plural *on*, and with the same postpositions. There are 7 adventitious particles, as exemplified in *larka*, Lat. *puer*, plur. *larka*, *pueri*; *larki*, *puella*, gen. *larkiyān*, *puellā*; plur. *kitabēn*, *libri*; plur. *larkiyon*, *puellē*; *larko*, *o pueri*. The suffixes *hi*, *i* signify self, very, just as; thus: *Ube tu hi ja*, Go thyself. There are 2 genders, masculine and feminine. Among adjectives the suffix *sa* denotes similitude, and is often used; thus, *kala-sa ghora*, blackish horse. Comparison is expressed by *se*, than, or by repeating the adjective, as *gori gori larki*, fine fine girl (very fine girl); there are also Persian forms, as *bih*, good; *bihter*, better; *bihterin*, best; and Arabic, as *fuzil*, Lat. *doctus*; *ufzul*, *doctior*; *fuzzul*, *doctissimus*. Pronouns: *main*, Lat. *ego*; *me-ra*, *mei*; *mājhko*, *mihi*, *mājh-e*, *me*, &c.; *ham*, *nos*; *ham-ara*, *nostri*; *hamon*, *nobis*; *hamen*, *nos*, &c. *Tain*, *tu*; *tera*, *tui*; *tājh-ko*, *tibi*, &c.; *tōm*, *vos*; *tāmh-ara*, *vestri*; *tāmhon-ko*, *vobis*; *tamhen*, *vos*, &c. *Yih*, *is*, *ea*, *id*; *iska*, *ejus*; *isko*; *ise*, *cum*,

&c. *Ye*, they; *inhon-ka*, their, &c. *Väh, ille*, &c.; *äs-ka, illius*, &c. *Ye*, those; *anhon-ka*, of those, &c.; *ap*, self; *kaon?* who, what? Oblique cases, *kis*, with postpositions; all other interrogatives begin with *k* (as the Latin with *q*). The 2d person of the imperative is the theme of the verb. The paradigm of conjugation by suffixing employs the following syllables in all persons:

	Masc. & inflect. fem.			Masc. fem.		
Infinitive, gerund { noun.....	-na	-ne	-nī	-no	-nin	-niyan
Pres't & also par- sint { tiple	-ta	-te	-tī	-te	-tin	-tiyan
Imper. and aor...	-a	-e	-i	-e	-in	-iyan
Fut. aorist...	-an-e	-e-(m. & fem.)		en-o-	en (m. & f.)	
Pluperfect	-ga	-gī		-ge	-gin	-giyan
	-ke (kar, e, karke, or karkar)					

The postpositive auxiliary is a form of *ho-na*, Lat. *esse*; thus: present, *hān, sum*; *hae, es, est*; plural, *haen, ho, haen*; for the subjunctive: *hanga, sim*; *hoga, sis, sit*; *hoenge, simus* and *sint*; *hoge, sitis* (masc. and fem.), &c. There are scarcely any anomalous verbs. Numerals: *ek*, 1; *do*, 2; *tin*, 3; *char*, 4; *panch*, 5; *chha*, 6; *sat*, 7; *ath*, 8; *nao*, 9; *das*, 10; *egarah*, 11; *barah*, 12; *terah*, 13; *chaodah*, *pandrah*, *solah*, *satrah*, *atharah*, *ānnis*; *bis*, 20; *tis*, 30; *chalis*, 40; *panchas*, 50; *sath*, 60; *sattar*, 70; *assi*, 80; *navve*, 90; *sao*, 100, &c. The language is rich in many significant particles, prefixes as well as suffixes, taken from Indian, Arabic, and Persian sources. The following is a specimen of its construction, with a Latin rendering:

Aiyam haen javani ke jab tak bahar hae,
Tempus est juvenutis-quo-usque ver est,
Piri jo ai phir to khizan ashkar hae.
Senectus si venit omnino autumnus evidens est.

The best grammar of this tongue is by Garcin de Tassy (Paris, 1835); there is a rudimentary grammar by W. C. Smyth (London, 1824), and there are dictionaries by Taylor (Calcutta, 1808), W. C. Smyth, abridged from Hunter's edition of the preceding work (London, 1820), and Shakspear (1834). See also *Intikhab-i-Ikwan-us*, &c. (Hindee selections), by J. Michael (London, 1829); *Nuklati Hindi* (tales, London, 1829); *Muntakhab-i-Hindi* (selections, translations, &c.), by Shakspear (London, 1834); and the various works of Dr. John Borthwick Gilchrist. Among the most celebrated poets in Hindostanee are: Mazed-i-daad (1080), Sadi (1250), and Khosran of Delhi (14th century). C. Of the Dravidan languages, the Telinga is bounded on the N. by the Orissan and the Mahrattée, on the E. by the bay of Bengal, from Ganjam (lat. 19°) to Pulicat (13° 20'), on the W. by the Carnataca, on the S. by the Tamil. It is separated by the desert of the Gonds on the Godavery from the Mahrattée. The ancient Telingana was divided by the Godavery into the Andhra and Calinga. Its territory comprises the Northern Circars, a great part of the nizam's territory, the whole of Cuddapah, Bellary, and part of the lower Carnatic. The territory of the Tamulic language is the Dravira-

desa in the Coromandel (Cholamandala), and extends from Pulicat to Cape Comorin (*Canya cumāra*, virgin's cape), and inland beyond the eastern Ghauts over Barramah, in Salem as far as Coimbatore, where there is a point of contact between itself, the Carnataca, and Malayalmee. It comprehends part of Mysore so as to reach the region of the Mahrattée in the N. W. The Carnataca spreads over the table-land between the eastern and western Ghauts, from Coimbatore through Mysore as far as Bejapoor and Beeder, where it comes in contact with the Mahrattée and the Telinga (lat. 19°, long. 78°), being bounded on the W. by the Concanee and by the ocean, and on the S. W. by the Malabaric tongue. This extends from Mount Dilly, between the Tamulic and the ocean, as far as Comorin, ascending eastward over the Ghauts. The northern strip of its area is occupied by the Tulava. 1. Most important of all is the Tamil (so named from the river Tamila), often confounded with the Malabaree, and spoken by about 10,000,000 persons. Tamils inhabit also the shore of Ceylon, between Tchilav and Battacaloe, where they are called Malabars. There are two dialects of it, viz.: *a*, the Shen (high, pure) Tamil, with a complicated system of conjugations, though of few tenses, containing scarcely any Sanscrit, and little known by the common people; *b*, the Codun (vulgar) Tamil. This language is the principal one in the Deccan, and either the mother of the other Dravidan idioms, or nearest to the mother of all of them. It has words of its own for all natural things, and borrows expressions only for moral or metaphysical notions. It may even have contributed to the development of the Sanscrit; for it has some sounds, for instance the cerebrals, which were originally foreign to the Sanscrit. It also had 16 characters of its own, which, however, were insufficient for all its sounds. There is a college at Madura where it is taught. St. Agattiyan (Agastya, in the Ramayana) is said to have been its inventor; fragments of his grammar are yet extant. It has 3 genders, 4 declensions, 2 numbers, invariable adjectives, verbs of 2 voices, several imperatives (beside the other moods), and 3 tenses. Postpositions perform the functions of flexions. Pronouns: *nān*, *en*, I; *nin*, thou; *avan*, *aval*, *atu*, he, she, it; *nām*, we; *nir*, *nim*, you; *avar*, they; *i*, this; *ā*, that. The suffix *adu* denotes possession, as *enadu*, mine, &c. Numerals: *onru*, 1; *irandu*, 2; *munru*, 3; *nalv*, 4; *anju*, 5; *aru*, 6; *chuv*, 7; *ettu*, 8; *ombadu*, 9; *patta*, 10, &c. Examples of substantives: *al*, man; *talei*, head; *kan*, eye; *pagal*, day; *pakalon*, sun; *neruppu*, fire; *tanni*, water, &c. The construction is most peculiar, inasmuch as a single verb concludes the sentence, while the others have the form of gerunds or participles. For instance, Matt. xii. 17: "Which was spoken by Esaias the prophet, saying: Behold my servant, whom I have chosen," is thus rendered:

Aeer shonnad ad endal: ilo iver nān
Ille (Esaias) loquendo id dicens: Ecce illum (quem) ego

teriduonda nammudeia panirideigarenumai nammale
 eligendo me-us serviens-que me-ab
siniegicappaddaveruma icuriar.
 amore-fautus qui est.

This kind of etymology and phraseology reminds us strongly of the characteristics of the Basque language, as well as of those of the Altaï-Uralic family (see FINNISH and HUNGARIAN LANGUAGES) on the one hand, and of many of the American tongues on the other. 2. At the time of the Mohammedan invasion Varangul ceased to be the metropolis of Telingana, and the state of Golconda followed the fallen empire. The Telinga language is also called Teluga, Calanga, Tenuga, Trilinga, Gentoo, and Badaga, and is spoken by about 14,000,000 people within its own area, as well as by the descendants of families which were sent by the kings of Vidyanağara to control their conquered subjects in the Carnatic and other parts of the Deccan. The people call themselves Telugavandlu (Telugu men), but are named Varug by the Malabars. Their language is soft, and contains all the sounds of Sanscrit, with more words of the same source than any of the other Dravidian idioms. Declension is by suffixes; the conjugation is richer than that of the Canarese. Pronouns: *nenu*, I; *nivu*, thou; *vadu*, *ame*, *adi*, he she, it; *memu*, we; *miru*, you; *varu*, they; *nadi*, my; *nidi*, thy, &c. Numerals: *vocati*, 1; *rendu*, 2; *mudu*, 3; *nalugu*, 4; *ayidu*, 5; *aru*, 6; *edu*, 7; *enimidi*, 8; *tommidi*, 9; *padi*, 10, &c. Examples of nouns: *al*, man; *tala*, head; *kannu*, ear; *pagalu*, day; *poddu*, sun; *nippu*, fire; *nillu*, water, &c. There are two Telinga dialects, the one literary or high, the other vernacular. Many works have been translated into the former from Sanscrit. The oldest native work dates from the close of the 12th century. Many were written during the reign of Krishna-Deva, the Augustus of these regions, in the first part of the 16th century. The first Telinga grammar is in Sanscrit, by the Brahmin Nannya Bhatta, at the end of the 13th century. There are others by B. Schulze (1728), and W. Carey (Serampore, 1814); selections and translations by Schulze, G. Sharpe (in Thomas Hyde's "Dissertations"), Hadrian Reland (Utrecht, 1706), and J. C. Morris (Madras, 1823); a dictionary by Campbell; and a work on the language and literature by Brown (Madras, 1840). The Telinga language furnished many of its words to the Malay. 3. Carnata, a powerful kingdom under the dynasty of the rajals of Bellala, residing at Balagami in Mysore, is also named Carnataca, Cannada, and corruptly Canara and Carnatic, these names being often confounded. The present Carnatic runs along the Coromandel coast, and Canara is on the W. coast, N. of Malabar. The area of the Canarese language comprehends the provinces of Mysore, Bednore, Sunda, Goa, Adoni, Ratdur, Kurnool, the Doab between the Kistnah and Tumbadra, and a part of Bejapoor, and Beeder as far as the sources of the Kistnah, the most fruitful table-land of India. The Haiga Brahmins of Canara claim it as their own idiom;

and Kinara in Mahrattée and Canara in gypsy signify shore, margin. From Mt. Dilly, through Mungalore, to Bednore, the Tulava dialect occupies what maps name Canara. Ancient documents of the kings of Mysore, written in the Hala-Canara, are now very rare. The modern Carnataca is much akin to the Telinga, varying from it by inflexions and by the alteration of initial sounds. Composition and derivation may be carried on to almost any extent. Pronouns: *nanu*, I; *ninu*, thou; *avanu*, *avalu*, *adu*, he, she, it; *navu*, we; *nivu*, ye; *avaru*, they. The possessives are nearly the same as in Tamil. Numerals: *ondu*, 1; *eradu*, 2; *muru*, 3; *nalku*, 4; *ayidu*, 5; *aru*, 6; *elu*, 7; *entu*, 8; *ombhattu*, 9; *hattu*, 10. Examples of substantives: *alu*, man; *tale*, head; *kannu*, eye; *hagalu*, day; *hotu*, sun; *benki*, fire; *niru*, water, &c. The language is purest in the districts of Naggeri and Harponelly, but much intermixed with other idioms at Bellary and Bangalore. There are many poems and Lingamitic works of the Shiva sect, full of absurdities, in the Carnataca, which was most cultivated from the 11th to the 14th century under the Bellala rajahs. See Thomas Estevao, *Arte de lingua Canarina*, and Diego Ribeiro, with other Jesuits (Goa, 1640); Mackerell, grammar (Madras, 1821); and W. Reeve, Carnataca and English dictionary (Madras, 1828-'32). The area of this language includes that of the inhabitants of the Neilgherry, or blue hills. 4. Malabar, a part of the ancient Kerala, together with Cochin and Travancore, or the Belad-el-folhal (region [of] the pepper) of the Arabs, is the area of the Malayalam (mountain tract) language. Father Paullino a S. Bartolomeo divided it into Granthan Malabaric, with many Sanscrit words, and common Malabaric. Other missionaries named it Tamulic. It is, indeed, a dialect of the Shen Tamil, from which it differs in pronunciation almost as the Portuguese does from Spanish. The common people of Madras understand it, although they speak the Codun Tamil. It is mild and harmonious, and lacks our sounds of hard *g*, *f*, and *z*. Among its cases there is a quietive, an instrumental, and a social one. There are 3 genders, and substantives have a dual number. Adjectives are indeclinable. Pronouns: *gnan*, I; *ni*, thou; *avan*, *aval*, *ada*, he, she, it; *gnangal*, we; *ningal*, you; *acara*, they; *enre*, mine; *minre*, thine; *avanre*, his; *gnangade*, our; *ningade*, your, &c. Numerals: *onna*, 1; *renda*, 2; *munnau*, 3; *nala*, 4; *anja*, 5, &c., like the Tamulic; but *surya*, sun; *tiyya*, fire; *vellam*, water, &c. In general about $\frac{1}{2}$ of the words differ from those of the Tamil. Most verbs are defective, and many impersonal; there are only 2 moods and 3 tenses, without personal suffixes, their relations being indicated by preceding words. The passive voice, however, and the negative conjugation are indicated by intercalating *pedonu* for the former, and *el* for the latter. The construction is analogous to the Latin. The ancient dialect was more perfect and had more of Sanscrit than the other Dravidian tongues. The Malayalam

was never much cultivated, as the only original work in it seems to be the *Kerala-Uppati*, which is attributed to Sancara Acharaya, dating from the reign of Cheruman Perumal (9th century). This prince became a Mohammedan, and granted privileges to the Jews of Cochin and to the Nestorian Christians of St. Thomas, which are preserved engraved on copper plates. The Malabar language varies in the interior from the idiom on the coast; the idiom of Coorg and the Tulava are considered as its dialects. See *Alphabetum Grandonico-Malabarico-Samscrudonum* (Rome, 1771). There are grammars by J. E. Hanxleben, P. Clem. de Jesu (Rome, 1774), R. Drummond (Bombay, 1799), Peel (Cottayam, 1841), and Spring (Madras, 1839); and dictionaries in Portuguese (Tranquebar, 1733), and in English by Bailey (Cottayam, 1846). There is an idiom of etiquette, collateral with the common speech, in these Dravidan languages; a phenomenon which occurs also in American tongues.—Within both great areas of Hindostan there are many isolated portions, especially in the mountains and jungles, which are inhabited by almost savage autochthonic tribes, who speak their own idioms or dialects of the primitive Indian language. Such tribes are the Bheels, Gonds or Khoonds, Rajmahals, Sonthals, Puharris, Coolies, Tudas, &c.—The graphic system of both the Sanscritoid and the Dravidan languages is, on the whole, the Devanagari, modified in the letters, but arranged and applied upon the same principles as that prototype. It may suffice to enumerate its varieties. Some are merely epigraphic, viz.: the Cabulic on coins of Bactrian kings (out of India); Magadhi of Bahar (inscriptions in Girnar), old Indian inscribed in western grottoes; Asocan (3 centuries before our era); Guzeratee, Assamese, that of the Gupta dynasty at Allahabad, &c. Letters used in calligraphy, nearest to the Sanscrit, are those of Cashmere, the Sikhs, Mooltan, Sind, Bengal, Orissa, the Malhattas, Guzerat, the Kayti Nagari, and Ranja. More distant from the prototype are the Telingau and Canarese, and the Malayalam (or Granthan). Other varieties still are the Nerbudda, Kistna, and Bandshin Mola. Derived from the Devanagari are also the characters of the Burmese, Cingalese, and Thibetans; also the Pali (or Siamese), the Aksara of Java, the square Pas-se-pu of the great Lama, the Bon-si of Japan, &c.

INDIAN OCEAN, the third in size of the oceans of the world. It is bounded N. by Asia, E. by the Sunda archipelago and Australia, S. by the Antarctic ocean, and W. by Africa. Southward the cape of Good Hope forms its W. limit, and the S. extremity of Tasmania its E. limit. Its length from N. to S. is about 7,000 m.; breadth from 3,500 to 6,000 m. Its principal gulfs are the Red sea, the Persian gulf, and the bay of Bengal, all of which open from its N. side. Its most important islands are Madagascar, Mauritius, Bourbon, the Comoro islands, the Seychelles, and Socotra, which belong to Africa; Ceylon, the Laccadives, the

Maldives, and the Andaman and Nicobar islands, which belong to Asia. The largest rivers flowing into it are, from Africa, the Zambeze, the Limpopo, and the Juba; from Asia, the Tigris, Euphrates, Indus, Ganges, Brahmapootra, and Irrawaddy. The great equatorial current, after passing the coasts of China, flows across the Indian ocean in a W. direction between lat. 10° and 25° S., and turning round the N. extremity of Madagascar flows S. through the Mozambique channel, and along the E. coast of Africa, and forms the cape current S. of the cape of Good Hope. The monsoons prevail from the N. limit of the Indian ocean to lat. 8° S. North of the equator the N. E. monsoon blows from October to April, while S. of it the S. W. monsoon prevails at the same season. Between the limits of lat. 10° and 28° S., the S. E. trade wind blows from April to October. The periods at which these winds change are marked by violent tempests, and the region between lat. 5° and 40° S. is greatly subject to hurricanes. The tropic of Capricorn divides the Indian ocean into two unequal parts. The northern part is the theatre of an immense navigation, nearly the whole commerce of Europe and America with China and India and the great Malay archipelago passing over its waters; while between Arabia and Persia on the west and India on the east there is an extensive trade carried on in native vessels, the origin of which dates from the remotest antiquity. It was on the shores of this ocean that the Greeks in the time of Alexander first became acquainted with the phenomenon of the tides; and the first authenticated and detailed account of its navigation that has come down to us was the expedition of Alexander's admiral Nearchus, who descended the Indus to the Indian ocean and coasted along its shores till he reached the Persian gulf. The southern part of this ocean is comparatively little frequented, being almost destitute of islands. It is traversed chiefly by vessels going to Australia and New Zealand by way of the cape of Good Hope. The chief ports of the Indian ocean and its tributary gulfs and rivers are Mozambique and Zanguebar in Africa, Aden and Mocha in Arabia, Bassorah in Turkey, Bushire in Persia, Bombay, Surat, Madras, and Calcutta in Hindostan, and Trincomalee and Point de Galle in Ceylon.

INDIAN TERRITORY, a large tract of land S. W. of the interior states of the American Union, between lat. 33° 30' and 37° N., and long. 94° 20' and 100° W.; length E. and W. 320 m., breadth 220 m.; area, 74,127 sq. m., or 47,441,480 acres. It is bounded N. by Kansas, E. by Missouri and Arkansas, S. by Texas, from which it is divided by the Red river, and W. by Texas, &c., on the 100th meridian. It is inhabited chiefly by immigrant Indians of various tribes and nations, and to some extent by indigenous tribes. The Cherokees are settled in the north, the Creeks and Seminoles in the middle, and the Choctaws and Chickasaws in the south. In the N. E., between the Neosho and

the E. boundaries, are small remnants of several tribes, as the Quapaws, Senecas, &c. The whole number settled within the territory may be from 100,000 to 120,000. Formerly this territory included a great part of Kansas and Nebraska, and the Indians in those territories, except such as have ceded their land, still hold extensive reservations, which are secured by treaty from the intrusion of the white settlers. The Indian territory is drained by the Arkansas and Red rivers and their tributaries. Both have their sources in the Rocky mountains, and after an easterly course, the first through and the latter along the S. boundary of the territory, flow directly into the Mississippi. These rivers are navigable by steamboats for an unascertained distance, and many of their tributaries are considerable streams, and will probably admit of being navigated by boats of light draft. With the exception of the Washita hills in the S. W. and the Ozark plateau, there are few irregularities of surface; but there is a general declination eastward, in which direction the rivers flow. Otherwise the whole country spreads out into vast undulating plains, abundantly watered by innumerable streams, and in many parts possessed of an exhaustless fertility. The climate is mild and salubrious, and, though comparatively cold in winter, is eminently fitted for agricultural pursuits. On the borders of the streams timber is abundant, and between long. 97° and 98° a narrow strip of timber, called the "Cross Timbers," stretches from the Arkansas S. and S. W. into Texas. Eastward of these the whole country is arable; to the west are elevated and sterile prairies, scantily covered with grass, and producing only a few stunted shrubs, yuccas, cactuses, grape vines, and cucurbitaceous plants. Vast herds of buffaloes roam over the plains, and in the west there are deer and other animals, the hunting of which is the favorite sport and necessity of the Indian tribes.—The several nations have had allotted to them separate districts marked by treaty boundaries, and each has its own government, subject only to the eminent sovereignty of the United States. In fact the several nations are entirely distinct communities. In general their civilization since their settlement in the territory has been progressive; they practise agriculture and many of the arts, and in their social relations have improved under the guidance of missionaries sent out by the various religious bodies.—The Indian territory was originally a part of Louisiana. It is not organized like other territories of the United States; but certain portions of it have been granted from time to time to the nations now inhabiting it. The name until lately was applied to all the territory occupied by the immigrant Indians W. of the settled states; but by the act of congress, May 30, 1854, the great body of the Indian lands were included within the limits of Kansas and Nebraska, and the Indian territory proper reduced to its present limits. (See CHICKSAWS, CHOCTAWS, CREEKS, &c.)

INDIANA, one of the interior states of the American Union, and the 6th admitted under the federal constitution, situated between lat. $37^{\circ} 47'$ and $41^{\circ} 46'$ N. and long. $84^{\circ} 49'$ and $88^{\circ} 2' W.$; extreme length N. and S. 276 m., average breadth 140 m.; area, 33,809 sq. m., or 21,637,760 acres. It is bounded N. by Lake Michigan and the state of Michigan, E. by Ohio, from which it is divided by a line drawn due N. from the mouth of the Great Miami river, S. by Kentucky and the Ohio river, and W. by Illinois, from which it is partly separated by the Wabash river. It is divided into 91 counties, viz.: Adams, Allen, Bartholomew, Benton, Blackford, Boone, Browne, Carroll, Cass, Clark, Clay, Clinton, Crawford, Daviess, Dearborn, Decatur, De Kalb, Delaware, Dubois, Elkhart, Fayette, Floyd, Fountain, Franklin, Fulton, Gibson, Grant, Greene, Hamilton, Hancock, Harrison, Hendricks, Henry, Howard, Huntington, Jackson, Jasper, Jay, Jefferson, Jennings, Johnson, Knox, Kosciusko, La Grange, Lake, Laporte, Lawrence, Madison, Marion, Marshall, Martin, Miami, Monroe, Montgomery, Morgan, Noble, Ohio, Orange, Owen, Parke, Perry, Pike, Porter, Posey, Pulaski, Putnam, Randolph, Ripley, Rush, St. Joseph, Scott, Shelby, Spencer, Stark, Steuben, Sullivan, Switzerland, Tippecanoe, Tipton, Union, Vanderburg, Vermilion, Vigo, Wabash, Warren, Warrick, Washington, Wayne, Wells, White, Whitley. Indianapolis, the state capital, is situated on the W. fork of White river, and near the geographical centre of the state. The other principal cities and towns are New Albany, Madison, Lafayette, Fort Wayne, Terre Haute, Evansville, Cannelton, Lawrenceburg, Logansport, Jeffersonville, Vincennes, South Bend, Crawfordsville, Richmond, Lamasco, Connersville, Greencastle, Delphi, Bloomington, Peru, Salem, Aurora, Attica, Plymouth, Rushville, Bedford, Corydon (its former capital), Wishanaka, Franklin, Cambridge, Brookville, Covington, Columbus, Michigan City, Shelbyville, Wabash, &c. Michigan City is the only lake port of the state. The population of Indiana in 1800 and at subsequent decennial periods, as shown by the U. S. census, was as follows:

Census Years.	White.	Free Colored.	Slaves.	Total.
1800.....	4,577	163	135	4,875
1810.....	23,590	893	237	24,520
1820.....	145,735	1,230	190	147,173
1830.....	339,399	3,629	3	343,081
1840.....	675,695	7,165	3	682,866
1850.....	977,134	11,262	..	988,416

Of the white population in 1850 there were 506,178 males and 470,976 females, and of the colored 5,715 males and 5,547 females. Density of population, 29.24 to the square mile; proportion to the total population of the Union, 4.26 per cent. Deaf and dumb, 537; blind, 353; insane, 563; idiotic, 938. Dwellings, 170,178; families, 171,564. Born in Indiana, 541,079; in other states, 390,313; in foreign countries, 54,426; unknown, 2,598. Natives of Indiana

resident in other states, 92,038. Of those born in other states and resident in Indiana, there were from Kentucky 68,651, Maryland 10,177, New York 24,310, North Carolina 33,175, Ohio 120,193, Pennsylvania 44,245, Tennessee 12,734, Virginia 41,819; of the foreigners, 19,847 were British and Irish, 1,878 British American, and 29,324 German. There were 571,626 under 20 years of age, 407,564 between 20 and 70, 8,860 between 70 and 100, 32 over 100, and 334 unknown. Occupations of 248,696 males over 15 years of age: 45,318 in commerce, trade, manufactures, mechanic arts, and mining; 163,229 in agriculture; 29,854 in labor not agricultural; 1,725 in sea and river navigation; 4,229 in law, medicine, and divinity; 3,031 in other pursuits requiring education; 677 in government civil service; 184 in domestic service; and 449 in other pursuits. The number employed in manufacturing establishments (included in the above) was 14,342. Births (1849-'50), 32,296; marriages, 12,423; deaths, 12,808. The federal population, 988,416, entitles the state to 11 representatives in congress.—If we except the river hills, Indiana is entirely wanting in mountains, and at least two thirds of the surface is level or undulating. A most singular feature of the country is the absence of any watershed such as almost every other geographical region presents; it has, however, continuous slopes of great extent, and the difference of elevation of the highest land and the Ohio river at the falls is nearly 600 feet, and a considerable difference (about 70 feet) is observed between the level of the Ohio at the falls and at the mouth of the Wabash. The river hills, above mentioned, extend at various distances from and parallel to the course of the Ohio and other streams, and enclose what are termed bottom lands, which are chiefly rich alluvions and thickly wooded. These hills along the Ohio are generally as high as the highest levels of the interior, often of a rugged and broken aspect, and where torn through by tributaries of the Ohio present much imposing scenery. Behind these a tableland spreads out and forms what may be termed the interior, and here every feature is changed; instead of the bottoms, with their forests, the most varied landscape appears—here groves of oak, ash, and other trees, there vast level prairies; and again the surface is undulating, and occasionally rises into hills from 100 to 300 feet high. For topographical description, however, the state may be divided into the valleys of its rivers. The Ohio valley, including that of the Whitewater, contains about 5,500 sq. m.; this is a limestone region, and was originally clothed with heavy forests. The hills are abrupt and broken, and numerous tributaries of the Ohio break through them. Of this division of the state about two thirds is good farming land, and the residue either too hilly or too sterile for profitable cultivation. The poorest parts are the flats at the heads of the streams. White river valley extends from the Wabash centrally through the state to the Ohio line, and covers

about 9,000 sq. m. It is almost uniformly level, and heavily timbered, except in the W. parts, where there are large prairies and barrens and ranges of low rugged hills. The whole valley is destitute of rock, and the soils are of the richest description. Most of the streams are clear and never-failing, and water power is abundant. The Wabash valley is the largest division, and embraces upward of 12,000 sq. m. It interlocks with that of White river, and the E. portion resembles it. It is equally fertile, but more broken. The middle part of the valley has abundant water power. From the river hills of the Ohio to the Wabash the surface is an inclined plane. The valley of the Maumee occupies about 2,000 sq. m. in the N. E., and carries its waters to Lake Erie. The N. and N. W. part of the state, drained by the St. Joseph's which flows into Lake Michigan, and the Kankakee, a constituent of the Illinois, is similar in its general character to the Wabash country, but the Kankakee is perhaps more swampy. Near Lake Michigan the country has extensive sand hills, which are covered only with stunted and shrivelled pines and burr oaks; but a few miles back from the lake shore a rich agricultural country is found.—The Ohio, the final recipient of the principal streams, borders the state on the S. from the Miami to the Wabash, a distance by the river's course of 380 m. Laughery, Indian Kentucky, Silver, Indian Blue, Anderson, Big Pigeon, Little Pigeon, &c., are its principal tributaries from Indiana, but none of them have a navigable capacity. The Whitewater joins the Miami 6 m. above its entrance into the Ohio. The Wabash has its head waters in Ohio; at first its course is N. W. to the middle of Huntington co., thence W. S. W. to Williamsport in Warren co., and the remainder of its course S. to the Ohio river. Its length is about 600 m., and it has been navigated about 400 m. by steamboats. Its principal affluents are, from the S. and E., the Salamanie, Mississinewa, Wilcat, Sugar or Rock, Raccoon, and Patoka rivers; and from the N. and W. Little Wabash and Embarras in Illinois, the Vermilion in both states, and in Indiana altogether Tippecanoe, Eel, and Little rivers. White river, the most important of these, falls into the Wabash 100 m. above its mouth; the West fork, its longest branch, rises near the Ohio line, not far from the S. sources of the Wabash and W. constituents of the Miami, and runs in a S. W. direction, receiving in its course Eel river, Fall creek, &c.; and the East fork, the principal feeders of which are Salt, Muscatuck, Sand, Clifty, Flat Rock, Sugar, and other streams, rises in the S. E. part of the state, and has a W. course to its union with the West fork, the two forming White river proper, 50 m. above its entrance into the Wabash. The St. Joseph's and St. Mary's form the Maumee, which passes into Ohio and to Lake Erie. Another St. Joseph's, with its tributaries the Elkhart, &c., passes into Lake Michigan. The Kankakee, a principal constituent of the Illi-

nois, runs sluggishly through the N. W. counties for 100 m.; extensive marshes everywhere bound its course. The Iroquois or Pickamink rises S. of the Kankakee, and runs nearly parallel to it for 50 m., and joins it in Illinois. Deep and Calumet rivers lie near to and S. of Lake Michigan, and in some places are only separated from it by banks of sand. Lakes and ponds are numerous, but none of great extent; they are found principally to the N. of the Wabash. Several of them have no outlets; they are generally clear, however, and have sandy shores and bottoms. They seldom exceed a few acres in extent, though several at the head of Tippecanoe river and Turtle creek, and near the city of Laporte, cover a considerable area. The largest, Beaver lake, near the Illinois line in Jasper co., has a surface of 10,000 acres, and on the S. is bordered by an extensive marsh.—Indiana is not rich in valuable minerals, but a geological survey, now in progress, is making important developments. The state is overspread with calcareous rocks of silurian and devonian age, and along its W. and S. W. portion these pass beneath the strata of the coal formation, which constitute the E. margin of the great coal field of Illinois. The area covered by coal measures in Indiana has been estimated at 7,700 sq. m.; but of this a portion is necessarily shallow, as the measures thin out toward the margin of their outcrop. Along the Ohio river are beds of cannel coal, which have proved of great value for supplying steamboats and factories. The canal passing from Evansville into the interior of the state affords an outlet for large bodies of coal which are not accessible to steamboats. At Cannelton on the Ohio cannel coal is found in a bed from 3 to 5 feet in thickness at an elevation of 70 feet above the river. Building stone and slate of several varieties are abundant, and clays useful in the arts are extensively distributed. Salt springs are found on the E. border of the coal formation.—The climate, like that of all the states W. of the Ohio, is liable to frequent and sudden changes. The prevailing winds in winter are from the N. and N. W., and in other seasons from the S. and S. W., and from the general evenness of the country have a free passage and are in constant motion. The heats of summer are thus modified; but in winter the cold is extreme, though less so than in Illinois. The mean temperature of the year is 57°; that of winter 37.6°, of spring 58.7°, of summer 76.9°, and of autumn 54.9°. This is nearly the climate of Bordeaux, France, which is 5° further N. and on the seaboard. The rain fall measures 42.8 inches in the year, viz.: 12.3 in winter, 10.5 in spring, 12.8 in summer, and 7.2 in winter. The earlier fruits blossom in March.—The soil is generally good, and much of it remarkably fertile. The richest lands are found along the Wabash, White, and Whitewater rivers. Few states have so little unavailable land, and even its wet and marshy lands are already being brought under successful cultivation. The

forests contain all the trees natural to the climate of the middle zone of the Union; oak and beech, however, preponderate; next in order are the sugar maple, hickory, ash, black walnut, poplar, elm, sycamore, &c.; and the principal undergrowths are dogwood, pawpaw, plum, thorn, persimmon, and crab apple. In most parts oak and beech mast is found in such quantities as to contribute largely to feeding and fattening hogs. There are few wild animals remaining in this state. Indiana ranks 4th in the relative amount of Indian corn produced, 6th as to wheat, and 6th as to wool. In 1850 the state contained 93,896 farms, covering 12,793,422 acres, of which 5,046,543 acres were improved. Cash value of farms \$136,385,173, and of farming implements and machinery \$6,704,444. According to the state auditor's report for 1853, the quantity of land assessed for taxes was 21,918,654 acres, being over 71 per cent. increase. The live stock owned in the state in 1857 consisted of 284,405 horses, asses, and mules, 727,057 cattle, 693,338 sheep, and 2,159,627 swine—in all valued at \$29,075,030; and the value of animals slaughtered in 1856-'7 was \$4,496,443. The products of agriculture in the same year were: wheat 9,350,975, rye 183,063, oats 4,621,800, Indian corn 39,833,366, barley 59,795, and potatoes 1,195,485 bushels; hay 342,118 tons; grass seed 113,848 bushels; hops 164,185 lbs.; maple sugar 980,823 lbs.; tobacco 486,734 lbs.; wool 1,455,113 lbs.; wine 22,203 galls.; value of above products \$23,866,503; of products of market gardens \$196,382, and of orchards \$904,998; of home-made manufactures \$2,474,262. Wine is chiefly made at the Swiss settlement at Vevay on the Ohio. The average crops per acre in 1850 were: wheat 12, rye 18, Indian corn 33, oats 20, Irish potatoes 100, barley 25, and buckwheat 25 bushels.—As a manufacturing state Indiana holds the 14th rank. In 1850 it had 4,288 establishments engaged in manufactures, the mechanic arts, and mining, which employed a capital of \$7,941,602, used raw material to the value of \$10,214,337, employed 13,677 males and 665 females, the cost of whose labor was \$2,809,116, and produced goods to the value of \$18,922,651. Among these establishments are enumerated 2 cotton factories, 32 woollen factories, 20 iron works (2 for pig, 14 for castings, and 4 for wrought iron), 59 distilleries and breweries, 353 tanneries, &c. Indiana has also a large number of flour, grist, oil, saw, and other mills. Madison, Indianapolis, New Albany, and Cannelton are the principal manufacturing towns.—Indiana has no direct foreign commerce; but it has a vast domestic and interstate trade by means of its navigable waters and magnificent systems of railroads and canals. Its geographical position is such that the whole land commerce between the manufacturing states of the East and the country west of the Mississippi must pass through its territory. The principal lines of railroad in Indiana are as follows:

Roads.	Termini.	L'ib. in.	Cost.
Ohio and Mississippi	Cincinnati to Vincennes	192	\$15,000,000
New Albany & Salem	N. Alb'y to Mich. City	258	7,029,494
Madison & Indianapolis	Madis'n to Shelbyville	135	2,984,516
Evansville & Crawfordsville	Martinsv. & Ind'lis. Evansville to Terre Haute	109	2,158,713
Indianapolis & Cincinnati	Indianapolis to Lawrenceburg	89	3,029,989
Jeffersonville	Jeffers'n.v. to Indianapolis	78	1,539,576
Cincinnati and Chicago	Richmond to Logansport	108	2,080,433
Indiana Central	Indianap. to Ohio line	72	1,910,361
Indianapolis, Pittsburg, & Cleveland	Indianapolis to Union City	84	1,912,402
Lafayette & Indianapolis	Lafayette to Indianapolis	64	1,856,277
Peru & Indianapolis	Peru to Indianapolis	74	2,000,400
Terre Haute & Richmond	Terre Haute to Indianapolis	73	1,585,809

Beside the above, 178 m. of the Michigan southern and northern Indiana road, 153 m. of the Pittsburg, Fort Wayne, and Chicago, and 167 m. of the Toledo, Wabash, and western are within this state; and there are several shorter lines. The union track railroad at Indianapolis connects all the lines centering at that city; it is $3\frac{1}{2}$ m. long, and cost \$265,033. The total length of railroad in operation at the end of 1858 amounted to 1,963 m. Among the principal railroads in course of construction are: the Junction railroad, from Hamilton to Indianapolis; the Chicago and Cincinnati; the Evansville and Indianapolis; the Indiana and Illinois central; and a number from Fort Wayne to the north and south. The Wabash and Erie canal, connecting the Maumee river at Toledo with Evansville on the Ohio, 467 m., has 379 m. of its course in Indiana, and passes through Fort Wayne, Huntington, Wabash, Peru, Logansport, Delphi, Lafayette, Attica, Covington, Montezuma, Terre Haute, Bloomfield, Petersburg, &c. The Whitewater canal extends from Lawrenceburg on the Ohio to Hagerstown, 75 m., and takes in its course Brooksville, Connorsville, and Cambridge.—Including the state bank and its branches, there were in Indiana in Jan. 1859, 37 banking institutions, with an aggregate capital of \$3,617,629; liabilities: circulation \$5,379,933, deposits \$1,723,840, due to other banks \$176,366, other liabilities \$68,215; assets: loans and discounts \$6,468,308, stocks \$1,252,981, real estate \$195,711, other investments \$111,089, due by other banks \$1,177,489, notes of other banks \$505,685, specie funds \$36,623, specie \$1,869,000.—The constitution of this state is dated Feb. 10, 1851, and superseded that of June 29, 1816. Every male citizen 21 years of age, and who has resided in the state 6 months, possesses the right of voting. The general assembly consists of a senate of 50 members elected for 4 years, one half every second year, and a house of representatives of 100 members elected for 2 years. The legislative sessions are biennial. The governor and lieutenant-governor are elected for 4 years; the former has \$1,500 a year and a dwelling, and the latter as president of the senate \$3 a day. The secretary of state (salary \$800 and perquisites), the treas-

urer (salary \$1,000, and as manager of trust funds \$800), the auditor (salary \$1,000 and perquisites, and as bank manager \$1,500), and the school superintendent (salary \$1,300) are elected for 2 years. The judiciary consists of a supreme court, 13 circuit courts, 44 common pleas courts, &c. The supreme court consists of 4 judges, chosen from grand divisions by the people at large for 6 years, and having \$1,200 a year, the attorney-general (salary \$1,000), and a clerk and reporter. Circuit judges are elected in their respective circuits for 6 years, and have \$1,000 a year; each court consists of a judge and prosecuting attorney, and judges of common pleas are elected in districts for 4 years, and have from \$300 to \$800, according to the population of the respective districts. The officers elected by the people in each county are, a clerk of circuit, auditor, recorder, treasurer, sheriff, coroner, and surveyor—the 3 first for 4 years, and the others for 2 years. Justices of the peace are elected by the people of each township for 4 years. The receipts into the treasury for the year ending Oct. 31, 1858, amounted to \$844,416, and there was a balance of \$650,654 from the previous year; total revenue \$1,495,070. The expenditures for the same year amounted to \$1,363,728. The chief sources of income in 1857 were: general and poll tax (general fund), \$654,431; common school fund, \$416,120; receipts on Wabash and Erie canal (by trustees), \$197,466; sale of swamp lands, \$362,101; state debt sinking fund, \$67,342; university fund, \$8,574; township library tax, \$11,276, &c. The principal expenditures were: executive officers, \$5,413; supreme and circuit judges, \$19,260; public printing, &c., \$18,408; state prison, \$50,991; interest on public debt and exchange, \$321,287; Wabash and Erie canal, \$318,047; benevolent institutions, \$62,864; university fund, \$9,667; township library fund, \$23,850; swamps, drainage, &c., \$407,872. In 1850 the value of taxable property in the state was \$152,870,399, and in 1857 \$317,932,958. The amount in the latter year was divided as follows: lands, \$101,844,254; improvements, \$41,253,765; town lots and buildings, \$33,796,862; railroad stock, \$15,743,583; other corporation stock, \$1,903,604; other personal property, \$122,688,698. Polls assessed in 1858, 199,621. A reappraisal of the real and personal property in the state, just completed, makes the aggregate about \$450,000,000. The poll tax is 50 cents, and the *ad valorem* tax 20 cents on the \$100 for state purposes. In 1856 the state tax was \$658,097, county tax \$1,073,782, road tax 225,454, school tax \$371,593, sinking fund tax \$67,342; total taxes \$2,459,336. The state debt on Nov. 1, 1857, amounted to \$7,357,074, and the canal debt (which depends solely on the Wabash and Erie canal for redemption and interest) to \$6,998,583. The principal institutions supported by the state are, the asylum for the deaf and dumb, the institute for the blind, and the hospital for the

insane at Indianapolis (in all of which admission is free to all citizens, the entire expense being paid by a special tax), and the state prison at Jeffersonville. The number of paupers supported in whole or in part in 1849-'50 was 1,182, and the number remaining on June 1, 1850, was 583; annual cost of support, \$57,560. The number of criminals convicted in 1849-'50 was 175, and the number in prison, June 1, 1850, was 59.—According to the census of 1850, Indiana contained 2,035 churches, with accommodation for 709,655 persons, and property valued at \$1,529,585. Of these, 430 were Baptist churches, 187 Christian, 2 Congregational, 5 Dutch Reformed, 24 Episcopal, 10 Free, 89 Friends', 5 German Reformed, 63 Lutheran, 779 Methodist, 57 Moravian, 282 Presbyterian, 63 Roman Catholic, 5 Tunker, 5 Union, 1 Unitarian, 15 Universalist, and 13 minor sects. By the same census the statistics of educational institutions were returned as follows: colleges 11, with 61 teachers and 1,069 students—annual income \$43,350, of which \$14,000 was from endowments; public schools 4,823, with 4,860 teachers, and 161,500 pupils—income \$316,955, of which from public funds \$134,078, taxation \$76,746, and endowments \$10,630; academies and private schools 131, with 233 teachers and 6,185 pupils—income \$63,520. The number attending school, as returned by families, was 220,961, and the number of persons over 20 years of age who could not read and write was 72,710. The return of the state superintendent of common schools for 1858 states the number of children between 5 and 21 years of age at 451,002, viz., 235,926 males and 215,076 females. The number of common schools was 6,835, with 4,700 male and 1,144 female teachers. In the year 660 new school houses had been built at a cost of \$279,805, and the number of volumes in school libraries in 1857 was 333,379. On Jan. 1, 1857, the school fund amounted to \$4,929,866, of which \$2,822,814 was productive. The amount apportioned from the school fund in the year preceding was \$339,881, and the tax assessed for building schools \$481,832. The chief collegiate and professional schools in the state in 1859 were as follows:

Institutions.	Founded.	Instructors.	Students.	Vols. in libraries.
State University, Bloomington.....	1830	6	115	2,200
Hanover College, S. Hanover.....	1832	8	73	5,400
Wabash College, Crawfordsville.....	1833	7	40	6,400
Indiana Asbury University, Greencastle	1837	6	266	12,000
University of Notre Dame, South Bend	1842	5	.....	.....
New Albany Theol Seminary, Hanover	1832	3	15	4,000
Theolog' l dep'tment Asbury University	1852	12	.....	2,500

There are also a Roman Catholic ecclesiastical seminary at Vincennes, a Presbyterian theological seminary at New Albany, a Methodist female seminary at Fort Wayne, a Methodist male and female college at Valparaiso, a Baptist college at Franklin, a large Campbellite institution, the "N. W. Christian University," at Indianapolis, and large educational institutions

at Tippecanoe Battle Ground and Burnettsville. —The number of newspapers and periodicals published in the state in 1850 was 107, with a circulation of 63,352, or annually 4,316,828 copies; of these, 21 were literary and miscellaneous, 84 political, and 2 religious; 9 were issued daily, 2 tri-weekly, 95 weekly, and 1 semi-monthly. In the same year the number of libraries other than private was 151, with 68,403 vols., viz.: 58 public, with 46,238 vols.; 3 school, with 1,800 vols.; 85 Sunday school, with 11,265 vols.; 4 college, with 8,700 vols.; and 1 church, with 400 volumes.—Indiana originally constituted a part of New France, and subsequently of the North-West territory. The exact period of its first settlement is not ascertained. In 1702 a party of French Canadians descended the Wabash, and established several posts on its banks, and among others Vincennes. The Indians inhabiting the country at that time, either from intestine feuds or inability, made little opposition to the new comers; and at an early period the settlers appear to have amalgamated with the savages, and subsisted more by the chase than by any regular industry. Of their simple annals they have left no record: for until 1763, when the country was ceded to the English, we hear nothing of them. By the treaty of cession, however, the settlers were confirmed in their possessions. The treaty of 1783 included Indiana in the United States. In 1788 an Indian war broke out, which caused great distress at Vincennes. In 1791 the Indians were attacked at the mouth of the Tippecanoe by Gen. Wilkinson, and by the subsequent victories of Gen. Wayne a dangerous confederacy was broken up and the tribes obliged to submit. The whole district now began to enjoy that repose of which it had been for many years deprived. By the treaty of Greenville in 1795 the United States obtained several eligible parcels of land, and settlement began to make considerable progress. On May 7, 1800, Ohio was erected into a separate territory, while all the country W. and N. was included in the new government of Indiana. The U. S. census of this year found in Indiana 4,875 inhabitants. In 1805 Michigan was also divided off, and in 1809 Illinois, leaving Indiana with its present limits. In all this period, however, the Indians had been troublesome, and greatly impeded settlement. Nevertheless the census of 1810 showed a fair increase, the population in that year amounting to 24,520 souls. In 1811 the general government determined to exert its power against the savages, who, excited and exasperated by the eloquence of Tecumseh, a leader of the Shawnees, and the most extraordinary man that had ever appeared among them, had committed grievous depredations. A force of regulars and militia was assembled at Vincennes and placed under the command of William Henry Harrison, then governor. On Nov. 6 of the same year the governor appeared before Prophets-town or Tippecanoe on the Wabash, and demanded restitution of the property the Indians

had carried off. After a conference it was agreed that hostilities should not commence until next morning, that an amicable arrangement might be made; but in violation of this armistice the Americans were attacked before daybreak by a large body of savages. Gov. Harrison, however, knowing the character of the enemy, had so disposed his troops as not to be taken by surprise. The combat that ensued, though short, was unusually severe; the Indians fought with desperate courage, but could not withstand the superiority of the forces arrayed against them, and the fate of the battle was soon decided. After burning the town and laying waste the surrounding country, the victorious army returned to Vincennes, and not long afterward the tribes sued for peace. The war with England now broke out, and gave a fresh impetus to Indian hostility; but again the savages were overwhelmed, and on the conclusion of peace in 1815 finally ceased to molest or trouble the settlers. In Dec. 1815, the territorial legislature petitioned congress for admission into the Union, and the privilege of forming a state constitution. A bill for these purposes passed congress in April, 1816; and soon after a convention was called, which on June 29 ensuing adopted the first constitution of Indiana. On Dec. 11, 1816, the state was admitted as a sovereign member of the United States. A more rapid immigration ensued, and continued without interruption; and though numbers passed westward into Illinois, the new state retained its share. In 1820 its population was 147,178, showing an increase of 500.2 per cent. in the past decade—a rate hitherto unexampled, and only once afterward surpassed, Michigan from 1830 to 1840 having increased 570.9 per cent. From 1807 to this date the sales of land amounted to 1,634,910 acres. In 1827 the Erie canal opened an outlet for the produce of the West, and the national road was commenced. Both these circumstances naturally stimulated settlement; and the sales of land so rapidly increased that in the 10 years ending in 1830 the total sales amounted to 3,558,221 acres. The population in the same year was 343,031, being an increase of 133.1 per cent. over that of 1820. Now commenced that speculation mania which terminated in the financial revulsion of 1837. In 1832 the legislature incorporated 8 stock companies for constructing railroads; in 1833 the middle section of the Wabash and Erie canal was commenced, and in 1834 the state bank with 10 branches was incorporated, to which were subsequently added 3 other branches. The result of these undertakings, and others into which the state entered, was a debt amounting to \$14,057,000 and a general bankruptcy. But in the 10 years ending in 1840 the population had doubled, and no less than 9,122,688 acres of public land had been disposed of to individuals; but none of the great works had yet been completed. For the next 6 or 7 years little progress was made, and in no one of these years was 100,000 acres of land disposed of. In

1846 the state debt, on which no interest had been paid since 1839, was consolidated and arranged into two classes, the state debt proper and the canal debt; and means were devised for paying interest on the former. Under the influence of this scheme prosperity returned. In 1850 the population numbered 988,416, showing an increase of 44.1 per cent. in the last 10 years. In 1851 a new constitution was adopted, and in 1853 the legislature passed a free banking law. Since 1850 indeed the whole economy of the state has been changed, and some of the great works for which it had sacrificed so much have been completed; its canal, the longest in the United States, is now open from the lakes to the Ohio, and the length of its completed railroads, which in that year was only 86 m., is now nearly 2,000 m. Should the population have increased at the same rate as in the last decade, it will amount in 1860 to 1,424,297.

INDIANA, a W. co. of Penn., bounded S. E. by Conemaugh river and drained by numerous small streams, area, 770 sq. m.; pop. in 1850, 27,170. It has a hilly surface, well timbered with white pine, &c., and abounds in iron ore and bituminous coal. The soil is moderately fertile. The productions in 1850 were 213,636 bushels of Indian corn, 209,763 of wheat, 493,182 of oats, 18,189 tons of hay, 105,436 lbs. of wool, and 470,251 of butter. There were 17 grist mills, 5 saw mills, 3 iron foundries, 61 churches, 3 newspaper offices, and 5,271 pupils attending public schools. The Pennsylvania canal passes along the S. boundary, and a branch of the central railroad extends to Indiana, the county seat.

INDIANAPOLIS, a city of Indiana, and the capital of Marion co. and of the state, situated in the centre of the state, on the W. fork of White river, at the crossing of the national road, 109 m. N. W. from Cincinnati; pop. in 1840, 2,692; in 1850, 8,090; in 1853, 12,000; in 1857, 24,000; in 1860, 30,000. It is built in the midst of a fertile plain, in lat. 39° 55' N., long. 86° 5' W. Most of the streets cross one another at right angles, but there are 4 long avenues radiating from a central square and traversing the city diagonally. In the middle of this square is a mound, surrounded by a circular street and ornamented with shade trees. The principal thoroughfare is Washington street, which is 120 feet wide. Indianapolis is a terminus of 8 railroads, viz.: the Indianapolis and Cincinnati, Lafayette and Indianapolis, Peru and Indianapolis, Madison and Indianapolis, Indiana central, Terre Haute and Richmond, Jeffersonville, and Indianapolis, Pittsburg, and Cleveland; while, including connecting lines, it is the focus of 17 different railroads. Several others are in course of construction. All these roads connect at a main passenger station in the city, and this, as well as the other depots for freight, &c., is remarkable for its fine proportions. The principal public buildings are the court house, county gaol, state house, governor's residence, post office, 2 market houses, and several charitable institu-

tions. The state house, a fine Doric building 180 feet long by 80 feet wide, with a colonnade and a dome, cost \$60,000. The state asylums for the blind, deaf and dumb, and insane, are situated here, and are all handsome edifices. There are several large public squares. The system of education is very complete, and beside graded free schools the city has a number of higher institutions of learning, including 2 female colleges, and the north-western Christian university. The last occupies a handsome Gothic building, and is open to both sexes. In 1859 it had 6 instructors and 178 students. Several church edifices recently erected are elegant specimens of architecture. In 1857 the city had 26 churches, viz.: 4 Baptist, 1 Episcopal, 1 Evangelical, 1 Friends', 1 German Reformed, 4 Lutheran, 6 Methodist, 5 Presbyterian, 1 Roman Catholic, 1 United Brethren, and 1 Universalist. It had 8 banks (including 3 private banking houses), 3 insurance companies, 9 printing offices (5 of which issued newspapers), a hospital, an orphan asylum, and 11 hotels. The manufacturing industry is active and increasing, abundant water power being supplied by Fall creek and the central canal. The principal manufacturing establishments in 1857 were 3 of woollen goods, 2 of boilers, 1 of iron railing, 1 of ploughs, 1 of candles, 1 brewery, 2 brass foundries, 2 iron foundries and machine shops, 3 planing mills, 2 saw mills, and 5 flour mills. The river is navigable as far as Indianapolis in time of high water, and is here crossed by a handsome bridge erected at a cost of \$25,000, and by several railroad viaducts.—Indianapolis was first settled by John Pogue in March, 1819, and in about a year from that time it numbered 15 families. It was chosen as the seat of the state government in Jan. 1821, and at the same time the legislature gave it its present name and appointed commissioners to lay it off as a town. It was incorporated in 1836, and received a city charter in 1847.

INDIANS, AMERICAN, the tribes inhabiting the continent of America before the advent of the white races from Europe; by some considered an aboriginal and single stock, by others a mixture of Mongolian, Polynesian, and Caucasian types, and by others as derived from the grafting of old world races on a true American race. Lawrence regards them as a distinct stock, differing from all others in physical, moral, and intellectual characters, and, with all their differences, as one and the same from Cape Horn to the arctic regions. He gives their characters as follows: skin brown or cinnamon-hued; iris dark; hair long, black, and straight; beard scanty; eyes deep-seated; nose broad, but prominent; lips full and rounded; and face broad across the cheeks, which are prominent, but less angular than in the Mongolian, and with the features distinct. The general shape of the head is square, with low but broad forehead, back of head flattened, top elevated, face much developed, and powerful jaws.

Dr. Prichard thus sums up his conclusions: "1, that all the different races aboriginal in the American continent belong, as far as their history and language have been investigated, to one family of nations; 2, that these races display considerable diversities in their physical constitution, though derived from one stock, and still betraying indications of mutual resemblance;" and that, as existing two centuries ago, they did not present any certain evidence of derivation from any special old world race. Their color no more entitles them to be called "red men" than some Polynesian and African tribes. He does not recognize an American type of skull, as Dr. Morton does, and says that their habits are as different as their external appearance, some being nomadic, others fishermen, others hunters, and others agriculturists. The most decisive evidence of relationship is in the characteristic structure of their languages, which, as Humboldt says, from the Esquimaux country to the straits of Magellan, have the same physiognomy though the roots are different. Galatin confirms this statement of Humboldt as to their distinct character, and their difference from those of the other continent, and Duponceau includes even the Esquimaux among the American languages.—The Esquimaux, situated above lat. 60° N., subsist principally on what they get from the sea, and extend across the continent, along the Polar sea. Next below them, to the W. of Hudson's bay, is the large family of Athabascans. Canada and the United States E. of the Mississippi were formerly inhabited by the Algonquin-Lenape and the Iroquois, generally at war with each other; S. of these were the Floridian tribes, the Creeks, Cherokees, &c.; W. of the Mississippi were the Pawnees and Sioux, &c.; on the Pacific coast the Californian and Oregon tribes, relatively lower in civilization than the Atlantic nations, and broken up into smaller and more diversified families; below these, in New Mexico, a more advanced family, stationary and agricultural (who do not appear to have been connected with any of the adjacent groups), called Pueblo Indians, but for whom the generic name of Moquis has been suggested. Mexico was occupied by a number of families, of which the Nahuatl or Aztecs were most powerful and most civilized. The Othomis, speaking a peculiar language, supposed by many to have Asiatic affinities, were also a numerous people in Mexico. In Central America the predominating family was the Tzendal or Maya, including the Quichés, Zutugils, Kachiquels, &c., who occupied the entire region of Chiapas, Tabasco, Yucatan, and Guatemala, and parts of the adjacent states, and who built the most remarkable monuments of aboriginal architecture with which we are acquainted. Fragments of the Nahuatl and Aztecs also existed in Central America, and another large group of tribes, in a low stage of development, to whom no specific name has been applied, extending from Honduras to Darien. In South America the leading and

more advanced families were the Muyscas of Colombia, and those which made up the Peruvian empire, among which the Aymara or Inca race was at the head. The Araucanians, to the S. of these, in Chili, were an indomitable people, bearing considerable resemblance to the Iroquois and Algonquins of North America. The remaining portions of the continent, including the great alluvions of the Atlantic slope, were chiefly occupied by the Guaranis; but along its northern coast were found the Caribs, the Dyaks of the new world, who spread also over the Antilles and most of the West Indian islands. In Patagonia and the extreme S. part of the continent were squalid families, close counterparts of the Esquimaux, and in some degree resembling the more debased Australians.—Dr. Latham places the American Indians among the Mongolians; and regards the Esquimaux, the only family common to both hemispheres, as physically Asiatics and philologically Americans, and on the Pacific coast passing gradually into the ordinary Indians in appearance, manners, and language. He does not favor a separation of the Esquimaux and the Mexico-Peruvians from the other Americans, on the ground that the civilization of the former is inferior and of the latter superior to the general condition; maintaining that the Esquimaux civilization is not lower, but only different from the American, as a necessary consequence of their habitat, and that the empire of Montezuma was superior to that of Powhatan only in the degree of its refinement. Dr. Pickering refers most of the American tribes to the Mongolian race; he calls the Californians, Mexicans, and West Indians, Malay Americans, a single glance satisfying him of their Malay affinity; if there be any remnant of the Malay now existing in eastern North America, he thinks it must be looked for among the Chippewas and Cherokees.—Dr. S. G. Morton, in the *Crania Americana* (1839), considers the American nations, excepting the polar tribes, as of one race and one species, but of two great families, which resemble each other in physical but differ in intellectual character; and that the superior family, the Toltecan, includes the semi-civilized nations of Mexico, Central America, New Granada, and Peru, and also the builders of the remarkable earth-works of the Mississippi valley. That the American race differs essentially from all others, not excepting the Mongolian, and that the feeble analogies of language, and the more obvious ones of civil and religious institutions and the arts, do not denote any thing beyond casual or colonial communication with the Asiatic nations; and that even such analogies as do exist may be accounted for in the mere coincidence arising from similar wants and impulses in nations inhabiting similar latitudes. He affirms that all the American nations, savage or semi-civilized, whether inhabiting the margins of rivers and feeding on fish, or roving the forest and subsisting on the spoils of the chase, possess alike the same long, lank, black hair, brown or cinnamon-colored skin,

heavy brow, dull and sleepy eye, full and compressed lips, and salient and dilated nose; and that the same conformity is obvious in the osteological structure of the race, as seen in the square or rounded head, the flattened or vertical occiput, the high cheek bones, the ponderous maxillæ, the large quadrangular orbits, and the low, receding forehead. "It cannot be denied that physical diversities do occur, equally singular and inexplicable, as seen in the different shades of color, varying from a fair tint to a complexion almost black, and this too under circumstances where climate can have little or no influence. So also in reference to stature; the differences are remarkable in entire tribes, which are nevertheless geographically proximate. Such facts are to be regarded as mere exceptions to a general rule, and do not alter the peculiar physiognomy of the Indian, which is as undeviatingly characteristic as that of the negro; for whether we see him in the athletic Carib or the stunted Chayma, in the dark Californian or the fair Borroa, he is an Indian still, and cannot be mistaken for a being of any other race." Dr. Knox maintains also a radical difference between the red Indians of America and the inhabitants of the old world, but thinks with Morton that the Esquimaux at one extremity of the continent and the Fuegians at the other, are not of the same stock, but rather connected with the northern Asiatic and the Australian families, whom proximity to the poles ought to have whitened, but whom the snows had failed to bleach. He regards the hypotheses which derive the American aborigines "from the Welsh, or Danes, or Mongols, or Asiatics, or Malays, or from the ten tribes headed by Prestor John, as old women's fables, not worth a moment's consideration." In almost solitary opposition to this general opinion as to the physical uniformity of the American race, stands the assertion of M. d'Orbigny, that "a Peruvian is not less different from a Patagonian, and a Patagonian from a Guaraní, than is a Greek from an Ethiopian or a Mongolian." Altogether, the weight of authority among ethnologists thus far rests with Dr. Morton, at least in the essential individuality of the American race.—A vast deal has been written in support of various hypotheses of migration of the American aborigines from the old continent, and there is hardly a country or a race which has not been assigned the honor of being its progenitor. And to complicate matters still more, there have not been wanting high authorities to suggest that the tide of emigration may have set the other way from America to Asia. Dr. Latham says: "I know reasons valid enough and numerous enough to have made the notion of the new world being the oldest of the two a paradox. Nevertheless, I know no absolutely conclusive ones." As the new world, so called, is the oldest geologically, it may prove to be so ethnologically. Hamilton Smith is inclined to believe that the aboriginal races were flat-headed, and that this conformation, whether natural or

artificial, was imitated by the intruding nations in Mexico and Peru. The hypothesis has been advanced that upon the table-lands of Mexico and Peru was created a race indigenous to America, and that this race was not essentially different in physical and mental traits from the American Indian as existing 3 centuries ago, the intruding Asiatic nations in turn dispossessing the aborigines, existing for a time independently, and then gradually becoming extinct, leaving, however, permanent traces in the languages, characters, habits, and traditions of the original race.—But, without going further here into the question of origin, and taking the American Indians as found on the discovery of this continent by southern Europeans, they are characterized by physical and mental traits by which they may be certainly recognized. Beside the physical characters given from Lawrence, the parietal region is much developed, the orbits are large, the feet and hands small and well proportioned, and the teeth white and sound; the facial angle is about 75°, 5° less than the European average. The stature of the Patagonians and of some northern tribes is about 6 feet, and individuals are found in various tribes more than 6 feet high, but the average is no greater than in other nations; the reputed giant races arose from the exaggerated tales of travellers, and the pigmies of the Mississippi valley are ascertained to have been children. The muscular development is not great, and there is a tendency to grow very fat when food is abundant and the habits of life lazy. Though active and agile in sports and pursuits of short duration, the Indian is inferior to the white race in labors requiring compactness of muscle and long continued exertion; they cannot endure so much fatigue nor carry such heavy burdens as the Canadian *voyageurs*; in the border warfare between the savages and the whites, the former generally were conquered in the close hug of mortal combat. The complexion varies from the dark brown of the California tribes to the almost white of the Mandans and the light Chinooks. The beard is scanty, and is prevented from appearing by the custom of plucking it out by the roots, a habit no more singular than that of shaving practised by civilized nations. Under a low bushy brow, the Indian has a dull, sleepy, half-closed eye, with little fire, unless when the passions are excited. The features are frequently regular, and the expression noble; many of the women are handsome. The skin is thinner, softer, and smoother than in the white races. The practice of artificially moulding the skull, adopted by the Peruvians, the Natchez, and the Oregon tribes, has been described under FLATHEAD INDIANS. The average volume of the brain, as measured in nearly 350 crania, is only 79 cubic inches for the semi-civilized and 84 for the barbarous tribes, though the posterior lobes are comparatively larger in the former in correspondence with their less intellectual faculty. Dr. Martius is of opinion

that the American nations are not living in the primitive simplicity of nature, but that they are the degraded remnants of a people once in a high state of civilization; this he infers from the remains of ancient institutions of government, of religion, and of social refinements in the Mexico-Peruvian tribes. However this may be, it may be said of the North American Indian that he was of haughty demeanor, taciturn, and stoical to the last degree; cunning and watchful in the surprise, persevering in the pursuit, and revengeful in the destruction of his enemies; cruel to prisoners of war, without regard to age or sex, and when himself a captive enduring the most painful tortures without a murmur, and with such martyr-like fortitude as would seem impossible to more impressionable natures without the sustaining power of Christian faith; brave and too often ferocious in war; idle and grave in peace, except when engaged in hunting and amusements; hospitable, and grateful for favors; of necessity a close observer of natural phenomena, his temperament poetic and imaginative, and his simple eloquence of great dignity and beauty of expression. As a race, however, the animal propensities strongly preponderate over the intellectual, and render their civilization, even with the help of education and Christianity, an event hardly to be hoped for. In their religious rites they erected no temples, though they made their sacred fires in the forests, and sang and danced in worship of the sun, which they naturally enough regarded as the symbol of the Great Spirit; the Mexico-Peruvians worshipped the sun with human sacrifices and the grossest rites, some of which appear to be of oriental origin. Those who occupied the greater part of the territory of the United States believed in the two antagonistic principles of good and evil, and in the duality of the soul, evincing the last by the custom of depositing food and other articles of daily use in the graves or on the tombs of the dead; they had a general belief in manitous, or some spiritual power over them for good or for evil, of which they took some animal or bird as an emblem; they had no idea of the Great Spirit's attribute of justice, of their accountableness to him here or hereafter, or of his interference in the government of the world. They believed in the transmigration of the soul into other men and into animals; they drew omens from the flight of birds, seeing in that of the carnivorous species indications of war, but they did not examine the entrails in their auguries; the forms and motion of the clouds were constantly consulted in their predictions of future events. They are firm believers in demons, witchcraft, and magic. They regard lunatics with special consideration, protecting them from injury and want; they have no idea of caste, never burn their dead, nor throw them into any sacred waters. They adopt a *totem* or symbol of the name of the progenitor of the family; this is generally some animal (the turtle, bear, and wolf being favorites), which is the mark

of families even when expanded into tribes. No marriage rite is necessary beyond the consent of the parties and their parents, but the wife may be dismissed for trifling causes, and polygamy is allowed; the ties of consanguinity are respected, and the rights of children acknowledged. Parents are fond of their children, and early teach them, according to sex, the arts which they will find necessary in after life; orphans and infirm or aged persons are supported by the nearest relatives or by individual charity. The wife and mother has the control of the wigwam, assigning places to all; while the husband is hunting, the wife is making mocassons, preparing skins, or ornamenting belts and leggins with shells, beads, and feathers; the women also plant the corn, and perform various other laborious occupations, which among other races are the work of men. Their cooking is simple, and is effected without salt or other condiments; they are rather abstemious in eating, and when supplies fail make no complaint; the men console themselves in trouble and dignify all important occasions by smoking *kinnikie*, which is the inner bark of the red willow, sometimes mixed with tobacco. Maple sugar making in the spring is a general time of carnival, and a source of a domestic luxury for the whole year. The Indian has a great advantage over the civilized mother in the ease and comparative painlessness of parturition; there are no baptismal rites, and children are named from some natural object or phenomenon; they are confined in a cradle so as to be entirely unable to move, causing the flatness of the occiput characteristic of the race; the cradles are so arranged that they can be carried on the back, hung in a tree, or placed upon the ground, without danger to the child. Black is their sign of mourning, the symbol of death taken from night; the bodies of the dead, dressed in their best clothes, are laid in state, and either buried with all their daily implements in a sitting posture, arranged east and west, or placed upon high scaffolds, or deposited in cases; sometimes mounds were raised, as among the thickly settled communities of the Mississippi and Ohio valleys. They show the utmost respect and veneration for the dead, selecting the most picturesque localities for their deposit, guarding them against desecration, and leaving nothing so unwillingly as the bones of their ancestors and relatives. They believe in life after death, where the spirit is surrounded with the pleasures of the "happy hunting grounds," though they have no idea that the acts of their present life can have any connection with their future happiness.—In ancient times the body was covered with skins and furs according to the seasons, but now the white man's clothes and blankets have supplanted their native dress; the mocasson of deer or moose hide is retained with singular pertinacity by the modern Indians and half-breeds, and also in the wilder tribes the ornamented leggins and head dresses; almost every article of dress is decked with beads,

shells, feathers, and tinkling things, and the naked parts of the body are smeared with bright or dismal paints expressive of their feelings and purposes; the scalp lock, which they leave on the top of the head for the benefit of any enemy bold enough to take it, is generally rendered more prominent by eagles' feathers or some trophy of the chase or battle. Their dwellings are made of bark, skins, and matings of their own making, stretched on poles fixed in the ground. Their arms consist of the bow and arrow, spears, tomahawks, and clubs, to which have been added from the whites the knife and gun; their arrow and spear heads are made of flint. Canoes are made of logs hollowed out, or of birch bark stretched over a light frame and skilfully fastened with deers' sinews and rendered tight by pitch. Their pipes, constant companions, are fashioned with great skill and of the strangest forms from soapstone of various colors, the most famous being the red pipestone of the north-west. They are exceedingly fond of games of chance and of active amusements; gambling with their plum stones is carried to as great an extreme as with the dice of the more civilized player; games of cards are in great repute among them, and they will stake the last piece of property in the hope of success. Among their amusements are ball matches on the ground or on the ice, races, firing at targets, &c.; their dances, whether festal, warlike, or funeral, are very picturesque. The antiquities found in Mexico and Peru, and the ruins of elaborate buildings in Central America, prove that the semi-civilized races there existing had made considerable progress in sculpture and architecture; the modern North American Indian shows his art in the ornamentation of pipes, canoes, weapons, musical instruments, cradles, and skins for lodges and garments. They carve with considerable skill bone, horn, wood, and stone. For details on their antiquities and modern carvings, the reader may consult the work of Schoolcraft.—Extensive observations by U. S. government officials and private individuals, show that the North American Indians are subject to the same diseases as the whites, when exposed to the same causes; their complaints formerly were few and simple, in accordance with their active habits of life, and their treatment of them a compound of superstition and ignorance; totally ignorant of pathology, and of course of rational medication, their remedies, generally mild, were given with little or no reference to the diseased conditions. They possessed no remedies not known to the U. S. pharmacopœia, and their list is no greater at the present time. They had as emetics thoroughwort, spurge, and Indian hemp; as cathartics, beside the above, the inner bark of the horse chestnut and butternut; as rubefacients, May weed and water-pepper (*polygonum*); they knew the efficacy of the vapor and cold baths and affusions in febrile, catarrhal, and rheumatic affections; bloodletting they performed by sharp scales of flint, and cupping by means of a hollow horn exhausted by the mouth. In asthma they

smoked tobacco and drank infusions of spice wood, sassafras, and skunk cabbage; in coughs, slippery elm and mallows tea, and decoction of the twigs of the pine and spruce; in renal affections, bearberry, spice wood, and gooseberry root; in diarrhoeas of all kinds, decoctions of the low blackberry, cranesbill, hardhack, white oak bark, partridge berry, and American ipecacuanha or Indian physic (*gillenla*); in dropsy, the bark of the prickly ash and wild gooseberry, and externally a sweat in heated earth; in amenorrhœa, sassafras, spice, and wormwood decoctions; in hæmorrhage, powdered puff balls, and astringents firmly bound on the wound. Incised wounds they sewed together with strings from the inner bark of basswood or fibres from the tendons of deer; diseases of the skin were treated with yellow dock, and abscesses by poultices of onions. Obstetrics was placed entirely in the hands of women, and blood root was given to facilitate parturition.—The U. S. government has maintained relations with about 75 tribes east of the Rocky mountains, and generally peaceful relations, except on the frontiers. It has been and is the policy of the United States to pay the Indians a fair equivalent for their lands, both by money and goods calculated to impress them with the advantages of civilized habits; and it is hoped by some that, by schools and missions, the banishment of intoxicating drinks, and a well regulated trade and system of government payment, the race may be arrested in its rapid decline. The number of American Indians has been greatly over-estimated; the recent census (1855), as given by Mr. Schoolcraft, shows that the whole number within the United States is only about 350,000, of which the semi-civilized races are about 66,000, and the Pacific tribes about the same. In 1825, when it became necessary to remove the perishing tribes to the W. of the Mississippi, the whole number E. of the river was estimated at 130,000, who owned 77,500,000 acres of land; in 1829 the entire Indian population of the Union was set down at 313,000, and in 1850 at 400,000. The number of Indians in the British possessions is supposed to be about 110,000, chiefly in the Hudson's Bay territory; in the Russian possessions, 40,000; in Mexico, 4,000,000; and in Central America, 1,500,000. The total number W. of the isthmus of Darien by this computation is 5,650,000. In South America their number is probably not far from 7,000,000, who are mostly civilized and converted to Christianity.

INDIANS, LANGUAGES OF THE AMERICAN. Columbus, on discovering land in his first voyage westward, believed that it belonged to India. He therefore called its inhabitants "Indians," and the same name was also given to the inhabitants of the continent. We know of no American language which exclusively corresponds with any of those of the old world, or of the regions that were discovered after America. The languages of the Indians cannot yet be categorically classified; nor do the names of the nations or tribes afford a clue for the unravel-

ling of the mystery that covers their filiation. The scanty materials that are at command are sadly confused and obscured by the ignorance of most of the reporters, and by the want of unity and system in their lucubrations. Alexander von Humboldt was the pioneer of a better method in this investigation. His brother William characterized all indigenous American languages as agglutinative, a feature which they have in common, to a certain extent, with the Uralo-Altaic, Dravidian, and Basque languages. Duponceau gave them the epithet of polysynthetic. They might be named incorporative or intercalative. We must not, however, believe that the sesquipedal words so lavishly attributed to them are really, in all cases, single words. They are often phrases, whose parts superficial observers have joined together, being incapable of analyzing them and hence of writing them separately. In the Sanscrit itself, and in many other ancient literary languages, the several portions of sentences and periods have been written together, without any spaces between them. Some of the most important indigenous languages are either monosyllabic, to a great extent, or they consist of short words. Balbi (*Atlas ethnographique*) gives 400 languages to America, viz.: 150 to the north, 60 to the middle, and 190 to the south. The greatest variety exists between the Amazon and the Orinoco. He divides them into 11 classes or areas. We can only give a general view of all the American languages. I. **NORTH AMERICAN** Under the general name of Esquimaux (raw fish eaters) Balbi comprehends all the languages of Greenland and of the northern countries, from the coast of Labrador to Behring's strait and the peninsula of Alaska, including also that of the settled Tehooktchees of Siberia. They consist of 2 groups: the eastern or Esquimaux proper, with 3 dialects in Greenland, Labrador, and on the N. and W. shores of Hudson's bay; the western, with the idioms of the Tehoogatchees, Konajs, Aleutians, and both American and Asiatic Tehooktchees, which differ more one from another than those of the eastern group. The dialect on Winter or Melville island lacks the sounds *f, g, r, z*. As in almost all American languages, the pronunciation is, so to speak, pectoral, and the consonants are indistinct. The Esquimaux have words for all shades of meaning in which an object is taken, according to its age, sex, and other categories. Many suffixes and few postpositions denote the accidents of declension, comparison, and conjugation. Examples of words: *kernertok*, (who is) black; *aglegiartorasuarpok*, he quickly goes away to write. Numeration proceeds by 20. For the Hudson's bay dialect, see the works of Dobbs, I. Long, and Parry; for that of Kotzebue sound, see Beechey; for that of the Tehooktchees, see Kosheloff and Chromensko.—The language of the Karalits (Greenlanders) has been by Danish missionaries more examined than any other North American idiom. It is scarcely understood beyond Baffin's bay and Davis's strait.

It lacks *d, f, h, z*, and, as initials, *b, g, l, v*; abounds in *t, k, r*; and accumulates hard syllables, although the people are gifted with a fine ear and musical taste. There are three dialects, viz.: the Kamuk of Upernavik; that of the Isle of Disco, the purest; and the southern, of Julianeshaab, which is sung. There is, beside, an idiom exclusively used by the female sex, having some peculiar sounds and words; a phenomenon occurring also among the Caribs, &c. It rivals the Greek tongue in richness of particles, and surpasses the Spanish and Italian in diminutive and augmentative forms, both of endearment and of aversion. Numerals beyond 5 are compounded; 20 is designated by the words "hands and feet," 60 by "3 persons," &c. The number of words for all circumstances of an action is superabundant, especially the expressions that relate to fishing. The Greenlanders possess traditions of contests with the first Norwegian settlers, satiric songs in a sort of blank verse, versions of the Bible, &c. For grammars of their tongue, see C. Bartholinus (1675), Thorhalleson (1776), and P. Egede (1750), who also made a dictionary, as well as O. Fabricius (1791-1804). On the American continent, S. of the Esquimaux, is the family of the Koloshes, found about Mt. St. Elias. Then there are very many tribes between lat. 48° and 55° N., with many discrepant languages that have not been yet well explored. Eastward of them is the family of the Athabascas, containing the Beaver, Hare, and other tribes, the Carriers, Squinters, &c., with idioms of their own.—The following families of tribes are better known. The Iroquois (or Mingoes) consisted at first of 5 nations, and now (since 1712), with the Tuscaroras from the south, of 6. All their languages lack *p* and *m*, the Oneida also *r*; this is the softest among them, while the Seneca is the most sonorous, the Mohawk the richest in words and formative particles, the Onondaga the most studied (by Zeisberger, 1775), and the Cayuga the least understood of any. To this family are also added the powerful Hurons, the Wyandots, the fierce Winnebagoes, &c., and the now extinct Nottoways and others, with dialects of their own.—The most extensive family is that of the Algonquin-Lenape, divisible into 4 groups: *a*, the eastern, containing the Massachusetts, Narragansets, Mohegans, Delawares, &c., now no more, and others yet living beyond the Mississippi; *b*, the north-eastern, the Scoffies, Abenakis, &c.; *c*, the western, the Shawanos (Shawnees), Miamis, Illinois, &c.; *d*, the north-western, the Knistenaux and Chippewas or Ojibbeways, speaking together one language, and related to the Athabascas, with many other tribes. The nature of their dialects has become tolerably well known by the grammars of the Massachusetts language by John Eliot (Cambridge, 1666; Boston, 1822); of the Delaware by the two Swedes Campanius (1702), by Heckewelder, and by Zeisberger; and of the Mohegan by Dr. Edwards (1758). The language of

the Delawares (properly Lenni-Lenape, primitive men) has two dialects, one of the two tribes called by Schoolcraft the Unamis and the Unalachtigos, and the other of their third tribe, the Minsis. It may be taken as the representative of the general characteristics of most American languages. There is no article and no gender, the want of either being supplied by words, such as *mo, m'*, one, *ochkrechun*, female of quadrupeds, and *ochkrechleu*, female of birds. Cases are indicated by suffixes, and the genitive by mere position before its regimen, thus: *getannitowit kirsall*, Son of God. There are 3 numbers, singular, dual, and plural. Possessive prefixes: of the first person *n*, 2d *k*, 3d *r, o*; plural suffixes: 1st *enana*, 2d *utaw, evata*, 3d *raral*; thus: *n-ooch*, my father; *k-ooch*, thy father; *n-ooch-enana*, our fathers; *k-ooch-utaw*, your father; *k-ooch-evata*, your fathers, &c. Personal pronouns: *kiluna*, we (all), and *niluna*, we (society), and, prefixed to verbs, *k. n*; thus: *kiluna Lenape-wit*, we Americans. Words are distinguished into the names of animate and inanimate objects; trees belong to the former, small plants to the latter. Diminutive suffixes, *tit* for animate, *es* for inanimate things; thus: *lenno-tit*, man-little; *wikram-es*, house-little; diminutive of endearment, *is*, as *mamal-is*, deer little and pretty. Pronouns compounded with adverbs: *nepe*, I also; *kepe*, thou also; *nekama*, he or she also, &c. There is no genuine substantive verb "to be," its meaning being inherent in the context of the phrase. Beside the voice and species of verbs in the Latin sense, there is an even greater variety of modified significations than in the Uralo-Altaic tongues (see HUNGARY, LANGUAGE OF), such as transitive or objective, causative, diminutive, frequentative, potential, permissive, optative, inchoative, continuative, reflexive, reciprocal, compulsive, meditative, reverential, circumstantial, &c.; all expressed by sounds or syllables that are intercalated into the verb, between the root and the particles of the person, tense, and mood. This development is named transition by Spanish writers on the Mexican and South American languages, in order to distinguish it from what Europeans call conjugation. In this manner, and by the incorporation of the object into the verb, several of our parts of speech are combined into a polysyllabic expression. Zeisberger admits 8 conjugations, the endings of which are here suffixed to various verbs: *achp-in*, to be there; *n'd-a*, I go; *wal-elendam* (well-affected), to rejoice; *n'penda-men*, I carry; *ahoa-an*, to love; *n'dello-re*, I say; *mil-in*, to give to; *peton*, to bring, &c. There are 3 tenses, with varieties of the future. Adjectives are mostly verbal and involved. Prepositions are many, both separable and inseparable, and conjunctions numerous; but postposition of particles is predominant. Examples with Latin translations will best illustrate this: *n'd-ahoaal-a*, amo; *k'd-ahoaal-a*, amas; *v'd-ahoaal-a*, amat; *n'd-ahoaal-aneen*, amamus; *k'd-ahoaal-ohhimo*, amatis; *v'd-ahoaal-evak*, amant. The object is denoted by

suffixes to the personal forms of the verb, thus: *n'dahoa-tell*, amo te; *k'dahoa-l-i*, amas me; *k'dahoa-l-arak*, amas illos; *k'dahoa-l-ihhena*, amatis nos, &c., through the whole scheme, both positively and negatively; so that at least 23 paradigms are needed to show the important transitions. *Matta n'dahoa-ltin-een*, non amamus nos mutuo; *mattatch n'dahoa-ltivan-een*, non amabimus nos mutuo (the *teh* being the sign of the future after the negative *matta*, although *mos* and *pish* also denote this tense). The passive suffix is *gussi*, as *n'dahoa-l-gussi*, amor; reflective postposition, *hakey* (body), as *k'dahoa-lak' hakey*, amas temet. Examples of involved signification: *n'matshi*, eo domum; *n'hilla pevi*, sum dominus mei ipsius (I am free); *tpis-kvikilleu*, properat tempus; *nachpiki*, sum talis natura; *pachsenunnen*, dividere ex æquo; *n'hil-lal n'keitayala*, dominum timeo-eum; *n'n'da-mochol*, est cymba mea, &c. In the language of the Massachusetts some expletive and euphonic particles lengthen the words without modifying their sense. This is the case with perhaps all American idioms. This tribe adopted some English words, treating them as its own; thus, to pay became *nup-pay-um*, solvo ei; *kup-paum-ush*, solvo tibi, &c. Verbal words: *vadshunnit-tonok*, salvatio, from *nucadshunait*, salvor. The Mohegan stood much in the relation of a dialect to the Delaware; thus, for instance, *k-thuvhun-in*, te amo te, analogously to the Magyar *szeret-lek* (tègedet), &c.—The Floridan family of languages consists of 3 groups, viz.: *a*, that of the Catawbas and Wocans; *b*, Cherokees; *c*, Choctaw Muskogees (or Creek Muskogees), Seminoles, &c. The Creeks, coming from the west, had expelled the Yamassees, a civilized tribe, which migrated to the south. The idioms of the Natchez, Uchees, &c., who once dwelt along the gulf, were different from those of the preceding tribes. The language of the Cherokees (originally Tsalakees, as one dialect employs *l* where another has *r*) has scarcely any etymic affinity with the Delaware. Its phonetism has been better illustrated than that of any other indigenous tongue by the syllabary contrived by Sequoyah (George Guess), a native, in 1826, who for some time published a newspaper (the "Phoenix") in New Echota. His scheme consists of 85 characters, including 6 vowels, *a*, *e*, *i*, *o*, *u*, and the French nasal *un*; and 9 simple and 3 combined initial consonants, *g*, *h*, *l*, *m*, *n*, *kv*, *s*, *d*, *dl*, *ts*, *w*, *y*, to which the vowels are attached. The figures themselves are a mixture of Roman letters with arbitrary ones, without any analogy with the sounds they represent, and without the symmetry and clearness of the Ethiopian syllabary. The sounds *k* and *g*, *t* and *d* occur almost promiscuously, and *dl* or *tl* are sometimes written *kl*. The grammatical character of the Cherokee is analogous to the Delaware. The dual of the 1st person is twofold, viz., the prefix *in* for I and thou, and *äst* for I and he, as *inaluniha*, I and thou bind it; *ästaluniha*, I and he bind it. Plurality is denoted by the prefix *t* or *te*, as *tetsigawati*, I see

things. Continuative action is indicated by the suffixes *sä* and *i*, as *tsikeysä*, I love him unceasingly. The perfect tense is of two sorts, one used when the narrator was present at the action, the other when he was absent; thus: *ukhun*, he killed him (in my presence), and *ukhë* (in my absence). The transitions of the verb are either, 1, as animate, or 2, as inanimate; thus: 1, *galuniha*, I bind it (an animal or tree); *haluniha*, 2d person; *kahluniha*, 3d person; dual: *inaluniha*, I and thou bind it; *ästaluniha*, I and he bind it; *istaluniha*, ye two bind it; plural, *italuniha*, we bind it; 2, *galunihawi*, I bind habitually, or am in the habit of binding, &c. Objects are frequently expressed merely by changes of the verb, as *kutuwo*, I am washing myself; *kulestula*, I am washing my head; *testula*, I am washing another person's head, &c., through 13 different forms. All words of relations between parts of speech are postpositions. Parts of the Bible and books of elementary instruction constitute the Cherokee literature. See John Pickering's grammatical essay in the "Transactions of the American Antiquarian Society" (Cambridge, 1836), and Bat-trick (Massachusetts "Historical Collections," 2d series, vol. x.). The tongue of the Choctaws (*Chahtahs*) differs so much from the preceding, that they cannot employ Guess's syllabary; but it differs from that of the Chickasaws merely in pronunciation. The Natchez had a soft idiom with three styles, viz.: the common one, another of etiquette, and a third of women when addressing men.—The family of the Sioux, S. of the Athabasca family, between the Mississippi and the Rocky mountains as far as the Arkansas river, consists of three groups: *a*, seven confederated (Dacotah) tribes or council fires, to which are also added the fierce Winnebagoes, and the Assiniboins (boiling meat by means of heated stones, hence Stone Indians), &c.; *b*, the Minetares, Upsarokas (or Crows), and the almost extinct Mandans; *c*, in the south, the Iowas, Omahas, Kansas, Osages, &c. The Dacotah language is simpler than most of the others; the verb has scarcely any modifications in form; prefixes predominate over suffixes, &c. See Schoolcraft, "History, &c., of Indian Tribes" (1851); J. R. Riggs's grammar and dictionary, in the "Smithsonian Contributions" (1851). The tongue of the Sioux is horribly guttural and sibilant, and less sonorous than the Algonquin and other idioms.—Several different languages are grouped as a family under the Caddoes and Nandaks, such as that of the Inies or Tachies, from whom Texas is named, and the idioms of the Natchitoches and Attacapas, all beyond the Mississippi. Another family is that of the Pawnees, Ricarees, &c.; another, that of the tribes on the rapids or falls of the Mississippi, such as the Blackfeet Indians with their branches. Lastly, there is the great family named from the Comanches, whose tribes and kindred tribes, as for instance the Apaches and Utahs, extend from Oregon to the gulf of California and the Rio del Norte; speaking

various languages and dialects, which, together with those of California, have not yet been sufficiently examined. II. MEXICAN AND CENTRAL AMERICAN. Mexico and Guatemala furnish a much more interesting field to glossology, on account of the higher cultivation of the indigenous race, and the more numerous and trustworthy materials which are either found in the many grammars and dictionaries of Spanish writers, or preserved orally by the natives. Clavijero enumerates many grammars and 31 dialects; among the former is that of the Mexican prince Antonio de Tovar Montezuma. Alexander von Humboldt counts 20 different languages in Mexico, and mentions 15 especially. Notwithstanding the zeal of the conquerors in destroying the nationality of the indigenous race, most of their idioms have been preserved, and even two professorships (one of the Aztec, the other of the Othomi language) have been, though without effect, established in the city of Mexico. Balbi places the tongues of Mexico and of a part of Guatemala in the 6th region, naming it that of Anahuac. At the time of the invasion by Cortes, the Aztec language was common to the Chichimecs (a general name of the most warlike portion of the several tribes), Acolhuas, Tezencans, Nahuatlacs, Tepanecas, and Tascalteans; all of whom derived their origin from a mysterious region named Astlan, and who occupied the high table-land of the Cordilleras. Their descendants inhabit the states of Mexico, Puebla, Michoacan, and Durango. Mecos is the present name of the free tribes of northern Mexico. We mention only the principal languages of this country. The Aztec or Nahuatl extended S. from the plain of Anahuac, with some interruptions, to Xicalango on the lagoon of Terminos, and was spoken also by the Pipils of San Salvador and a small family of aborigines on Lake Nicaragua. This language lacks the sounds *b*, *d*, *g*, *r*, *s*, *j* (Spanish), *ll* (Span.), *gn* (Italian), and initial *l*; but it abounds in *t*, *z*, *ch* (Span.), *tz*, and in the syllables *tlā*, *tli*, *atl*, *itl*; *x* is pronounced with a peculiar guttural sound. The tone generally strikes the penultimate of the polysyllabic expressions, in which the particles *ca* and *ti* predominate. Specimens of proper nouns: *Tenochtitl-titlan*, stone-nopal-near; *Cimatl-an* (for *tittlan*), root-near, both names of cities; *Acam-pichtli* (of *acatl-maitl-pachoa*), reed-hand-press, name of the first Mexican king; *Nezahual-coyotl*, hungry fox (for sagacians and needy in youth), name of a prince; *Montecuhzoma* (Montezuma), master severe, &c. Example of word formation: *tlaxcalli*, a sort of cake; *tlaxcalchihua*, making of cakes; *tlaxcalchihubni*, cake-maker; *tlaxcalchihuloni*, tool by which cakes are made; *tlaxcalchihucan*, place where they are made. The terminations of words are frequently either omitted or altered in composition; thus: *no-cal*, my house; *i-cal*, his house (from *calli*, house); *no-teouh*, my god (from *teotl*, god); *amatla-cuilo-tquilca-tlax-tlahuilli*, agave (for paper)-writing-sent-payment-carrier, mean-

ing postage, &c. Gender and number of inanimate things are not indicated by flexions, but by epithets, such as *mice*, much, many; while those of animate objects receive a reduplication in the beginning or in the middle, together with the suffix *tin*, thus: *miztli*, cat, *mimiztin*, cats; *ichpochtli*, girl, *ichpopochtlin*, girls. Augmentatives and diminutives are as numerous and varied as in the language of the Karalits. Verbs may be formed from all nouns, and *vice versa*, by the suffix *liztli*; thus: *nemiliztli*, life, from *nemiz*, to live. Modified verbs are as numerous as in the tongue of the Lenni-Lenape. Postpositions and suffixes express the relations between words. The numeration is vigintesimal, and 1, 2, 3, 4, 5, 10, 15 are the elementary numerals. An idiom of veneration runs parallel to that of common address, as in the Natchez, Creek, &c., as well as in the idioms of the Malays and Japanese. Spanish prepositions and other words are also used, as for instance *hasta* *moztla*, till to-morrow. Traces of the Aztec are found among the tribes on the Nootka sound, consisting of similar phonetism and terminations.—Insulated within the territory of the Aztec, as above mentioned, are several other languages. The Cuiclateca is spoken near the city of Mexico. The Huasteca, N. E. of this, is analogous to the Maya of Yucatan, of which it may be considered a dialect, with etymons resembling those of the Finnic and Ostiac; it has no substantive verb; uses suffixes to denote flexions, and has many modifications of the verb; forms the plural of nouns by prefixing *cham*, much, and suffixing *chie*, &c. West of the city are found two languages, Pirinda and Tarasca. The latter is very sonorous and harmonious; it contains a very mild *r*, lacks *l* and *j*, and does not use *b*, *d*, *g*, *r*, *i* as initials; it frequently intercalates *s*, abounds in modified verbs, and performs grammatical functions by suffixes. Specimens: *pireni*, to sing, *pareponi*, to go to sing, *pireponi*, to come to sing; *tirehaca*, to eat; *tirerahaca*, to feed; *hoponi*, to wash, *hopocuni*, to wash hands, *hopoaduni*, to wash feet, *hopomuni*, to wash the mouth, &c., in analogy with the Cherokee. The Cora, spoken in Zacatecas and Guadalajara, approaches somewhat the Aztec. Opposite the mouth of the gulf of California is the Tepeguana; N. of this the Topia; at the head of the Cinaloa river, the Tubar; and E. of the first named, the Tarahumara. The last is akin in its roots to the Aztec, but in its grammatical particles is a distinct idiom; specimens: *Pedro nono-la*, Pedro father-his; *lessi-ameke*, they are weary (Lat. *languent*), a pattern of participial adjectives. Conjunctions are placed after their nouns. Higher up the gulf of California, in Sonora, are the Guazave, Ahome, Yaqui, Eudeve (Opata), and, most widely extended, the Pimo, all resembling the Tarahumara. There are various languages on the rivers Gila and Colorado, and others among the eastern tribes of New Mexico.—As one of the exceptions from the mass of polysynthetic American languages, that of the

Othomi deserves particular attention. It is the most extensively spoken after the Aztec, and was formerly used by many warlike tribes in the northern plains of New Mexico; it is now intermixed with the tongues of other tribes in the dioceses of Michoacan, Mexico, and Puebla, and it is the idiom of the laboring people in the metropolis. It lacks *f*, *l*, *r*, and *s*, and abounds in guttural and nasal sounds that cannot be written by our letters; its *k* is likened to the sound of a nut cracked by a monkey; *p* and *t* resemble one another, and are ejaculated similarly to the cerebials of the East Indian languages. Its vowels are also indescribable, and analogous to the tones of the Chinese. Most words are monosyllabic, but there are a few of two or three syllables. The same word is employed in different parts of speech, according to the sense of the context (see CHINESE LANGUAGE), or by particles denoting the various grammatic accidents. The noun is sometimes distinguished by the addition of *na* (a kind of article), or by *sa* (sign of an adjective); thus: *madi*, love and to love; *nheau*, good, well, *na dheau*, goodness, *sa dheau*, good. Its roots differ altogether from those of the other Mexican languages; but it borrows some conjugational forms from the Aztec, Huasteca, &c. Its northern dialect is the Mazahua. The southern languages of Mexico offer almost a greater variety. The Matlazinga is spoken in the Toluca valley; the Tlapaneca in Puebla; and the Totonaca in Puebla and Vera Cruz. The last has 4 dialects, lacks *b*, *d*, *f*, *r*, *k*, distinguishes only the number of animate things, and has a very rich conjugation. The Misteca, spoken in Oaxaca, lacks *b*, *p*, *f*, *r*, has many modifications, is analogous in etiquette to the Natchez, and has 6 dialects. The Zapoteca is spoken in the ancient metropolis Teozapotlan. The Popoluca (a collective name of several tribes), Chinanteca in Chiapa, and Mixa must also be mentioned.—Among the languages of Yucatan the predominant is the Maya, to which the extinct idioms of the greater Antilles seem to have been akin. When the Spaniards landed at Campeachy the Mayas held the whole peninsula, and a part of Tabasco. M. de Waldeck (1838) thinks the Maya to be analogous to the Tehole; and B. M. Norinan (1848) supposes that it prevailed in Anahua before the invasion by the Toltecs. It is spoken even by the creoles, mixed with Spanish. It resembles the Othomi in monosyllabism and tones; it has 6 gutturals which are extremely rough; it lacks the sounds of *d*, *f*, *g*, *r*, *s*; its words are not inflected. The plural is formed by *ob*, the comparative by *il*; thus: *che-ob*, woods; *tibil-il*, better. There are 4 conjugations. The language abounds in elisions. As spoken in a district of Valladolid, it is praised for elegance and conciseness. Oviedo (1526) heard 5 different languages near Lake Nicaragua, one of which was the Aztec or Nahuatl. Stephens mentions the Pipil on the Pacific coast, which is now proven to be an Aztec dialect, and speaks of 24 languages or dialects.

Juarros distinguishes 7 languages, viz.: Quiché, in the N. part of Guatemala, on the confines of Chiapas; Kachiquel, that of the most cultivated people between the city of Mexico and Peru, whose metropolis was Patinamit, of which there is a professorship in the university of Guatemala; Subtngil and Mam in Vera Paz; Pocaman or Poconchi, on the confines of San Salvador; Sinca, on the Pacific shore, from Escuintla to the Rio de los Esclavos; and Chortí, in Zacapa, as far as the ancient city of Copan. III. SOUTH AMERICAN. The Caribs (whose vernacular name was Calina or Galibi) once dwelt on the shores of Colombia, in Guiana, and on the Lesser Antilles. They speak almost 30 dialects, which are very harmonious, but of a weak utterance, so that *l* and *r*, *b* and *p*, *g* and *k* are pronounced almost alike. Nearly all words end in vowels. On the whole, their language has the character of the former Floridian stock. Many tenses, and a passive voice with the auxiliary substantive verb, also distinguish the Caribbean from the bulk of the American tongues. Conjunctions conclude the sentence; animate and inanimate things have different forms of expression. The speech of females differs in words (not in grammar) from that of men. Terminations of cases: dative *ra*, accusative *pona*, ablative *ta*. Persons: masc. *au*, *inra*, fem. *nleuca*, *niuro*, I; *nana*, we; *amoro*, *iburra*, *amenle*, thou; *hocoya*, you; *lika*, he; *moscan*, they. Possessives: prefix *e*, my; *a*, thy; suffix *o*, his. Verbal pronouns: prefix *s*, 1st person; *m*, 2d; *n*, 3d; plural, *nanan*, &c. Of the principal Caribbean dialects, the Chaymas is spoken in Cumana. The Tamanaca, spoken anciently by a very powerful people, now on the right bank of the Orinoco, has more verbs obtained by means of prefixes than perhaps any other language; it lacks *f*, *s*, and *g*, has 6 conjugations, many tenses (a preterite of yesterday, another of 2 weeks ago, a third of 6 months and more ago), and forms for near, others for distant objects; the auxiliary of the passive is *uociri*, to be; brother and sister are distinguished as to age, as in Magyar and other Uralo-Altaic tongues. The Aravaca, on the banks of the Berbice and Surinam, has many remarkable peculiarities, such as the formation of the passive voice by changing the final *n* of the infinitive active into *hun*, and many prefixes and suffixes. Caribbean grammars were published by Fathers Tauste, Ruiz-Blanco, R. R. Breton, and Gilij, and dictionaries by the first and last named (1665-7), and an anonymous one (Paris, 1763). Some writers represent the Caribbean language as a branch of the Guarani, which they divide into the southern or Guarani proper; the middle or Tupi of Brazil, from the island of Santa Catarina to the mouths of the Amazon; and the northern or Caribbean.—The following 7 languages are worth notice, viz.: 1. That of the Mozcas (Muyseas), who before the advent of Europeans inhabited the table-land of Bogota, and who in consequence of a culture higher than that of their neighbors extended

their idiom among them. It was once brought into the city of Bogota, but is now extinct. It counted by 20, had a negative conjugation, and many excellent peculiarities; it lacked *d* and *z*, and had an indistinct *l*. 2. Of the Sappures, on the upper Orinoco, similar to the Caribbean, but less rich; the conjunctions were few and closed the sentence. 3. Of the Salivis, between the Meta and Guaviare, affluents of the Orinoco, and in the province of Casanare; full of nasal sounds. 4. Of the Ottomacas, between the Apure and Sinarucu, spoken with the utmost rapidity. 5. Of the Yauras, between the Meta and the Casanare; it lacks *s*, abounds in the Spanish aspirate *j*, and uses the substantive verb as auxiliary of all others. 6. Of the Betois, on the Casanare, without *p*. 7. Of the Mainas, in the province of that name, differing from its neighbors. In the eastern parts of Colombia there are Caribbean dialects. Grammars have been prepared by Fathers Anisson, De Tauste, and De Lugo, and a vocabulary by De Tauste (1680).—The And-Peruvian family of nations is divided into four classes: 1. The Quichuas (pronounced with a faucal croaking sound, hence also written Quichihuas) or Incas were more widely spread at the time of the European invasion than they are now. They differ from the other indigenous races of South America, resembling more the Mexicans, and being of a dark olive complexion. The language of the Incas, however, was not intelligible to their subjects, and Fr. Lacroix supposes that it was a sort of hieratic jargon, unknown to the profane. The Puquini about Paz and Lima obstinately conceal their idiom from foreigners. The language of the Quichuas was extended, by the agency of the incas, over their whole empire; so that it was known to all officers and educated persons from Quito as far as Chili and the kingdom of Tumac, and, sporadically, as far as the banks of the Plata. It consists of five dialects: *a*, Cuzcucano, one of the most cultivated idioms of South America, spoken also by the creoles of Lima and by others; *b*, Quiteña, the hardest and most corrupt; *c*, Lamano of Truxillo; *d*, Chinchaisuyo of Lima; *e*, Calchaqui of Tucuman. The Quichua sounds very harsh and explosive; it lacks *b*, *f*, *v*, *d*, *g*, and *l*; has 3 cases and prepositions; counts by tens up to hundreds of thousands; and has a very rich and perfectly regular conjugation, even of the substantive verb. Its phraseology is simple, and the verb concludes the sentence. It was used for writing even by the incas, and the Limas prided themselves on their speaking it purely. There are grammars by Domingo de S. Tomas (1560), D. de Torres Rubio (1603), D. G. Holguin (1608), and many others. 2. The Aymares, probably descended from the high plains about Lake Titicaca (from the bosom of which Manco-Capac, the founder of the inca dynasty, was said to have risen), are almost surrounded by the Quichuas, but differ from them in manners and language. This, though it has many harsh sounds, words, and gram-

tical forms, is spoken by the descendants of Europeans at La Paz, and by about 400,000 aborigines. It is rich in many modified expressions (having for instance 12 homonyms of the verb to carry), abounds in postpositions, and has several dialects. There are grammars by L. Bertonio (Rome, 1613), and D. de Torres Rubio (Lima, 1616). 3. The Atacamas, numbering about 8,000, on the W. slope of the Andes. 4. The Changos, about 1,000, on the Pacific. On the E. declivity of the Andes, in Bolivia, the Antisian family (so called from the eastern of the three Cordillera ranges, and from which the word Andes is applied to all the ranges) contains five tribes with their own tongues, viz.: the Yuracares (*yurac*, white, and *cari*, men), Mocetenes (Chunchos), Tacanas, Maropas, and Apolistas; about 15,000 in all. (Tschudi, *Antigüedades Peruanas*, Vienna, 1852.) N. E. of Bolivia, on the Ucayali, are the Panos, who used a sort of hieroglyphics, and the Carapachos, who seem to bark in speaking. On the pampas of La Plata, drained by the Parana and both Salados, there are about 40 tribes, especially in the forests of Chaco, of which we mention the most prominent. The Abipones, the centaurs of South America, seem to sing their long words; they have a peculiar sound, half *r* and half *g* (like the Arabic *ghain*), and count in their language only as far as 2. The Mbayas (Guaycurus), on the Paraguay, also great horsemen, had an ancient idiom, and speak now the Enacagas, without nasals or gutturals; they have also a woman language (man, for instance, is called *hulegre* by men, but *aguina* by women) and castes, and are called Lenguas by the Spaniards. The Moxos, about 13,000, near Matto Grosso in Brazil, have a mild harmonious tongue, many modified forms of verbs, and very few numerals. There is a grammar and vocabulary by P. Marban (Lima, 1701). The Chiquitos, about 15,000, near the Argentine Gran Chaco, have many nasal and guttural sounds, the French *u*, and an idiom for females, as well as a language of etiquette used in addressing God and superiors.—In the vast regions E. of the river Paraguay, and of a line from its sources to the mouth of the Orinoco, thence bounded by the shores of the Atlantic and on the S. by the Plata, there is, so to speak, an archipelago of tongues in the ocean of the Guarani family. In Brazil alone, Texeira counted 150, and Spix and Martius 300 tribes with as many languages; but, as their affinities cannot be determined clearly, owing to the paucity of their consonant elements, it is impossible to know which of them are languages and which are dialects, or merely local idioms. Hervas reports 51 languages as different from the Tupi, and 16 as akin to it. This Tupi is one of the three great branches into which the language of the Guarani is divided, viz.: 1. Eastern Guarani (the *lingua geral*, general language of Brazil), which lacks *f*, *l*, *s*, and *v*, but has German *ch*, English *j*, French *u* (written *y*) and nasals, Spanish *ñ* and *ll*; also *mb*, *nb*, *nd*, *ng*.

Cases: *aba*, homo; *abaupe*, homini; *abaki*, homine. There is no plural flexion. The comparative is formed by the suffix *ete*. Numerals do not go beyond 4, 5 being expressed by the word *hand* (*ambo*), 10 by 2 hands—(*opacombo*), and higher numbers in Spanish. Pronouns: *yxe*, I, my; *nde*, thou, thy; *ae*, he, y, his; *oro*, we (I and he); *yande*, we (I and you); *pee*, you, *pe*, your. Verbs: *a-juca*, occido; *ere-juca*, occidis; *o-juca*, occidit, &c. Tenses are indicated by adverbs; voices and many kinds of verbs by intercalating particles. There is no substantive verb. Examples of phrases: *Conanga xe remimbota* (Lat. *hæc omnino mihi voluntas*), I wish it; *Xe marangatu (mihi bonitas)*, I am good; *Ore rub ybagype tec-oar*, *imoete-pyran nde rera*, Our Father heaven-in being, hallowed-be thy name. There are grammars by Anchieta (Coimbra, 1595), and Figueira (Lisbon, 1795), and a dictionary by the latter author. 2. Southern Guarani (Guarani proper), on the rivers Parana, Paraguay, and Uruguay; spoken by many tribes. 3. Western Guarani, spoken by the Chiriguani (lat. 18° to 22° S.) on the Pilcomayo, the Guairay in the missions of the Chiquitos, the Cirionos near Santa Cruz, and in 160 villages between the Chaco and Mapayo streams, in its purity. That dialects of the Tupi once prevailed over many districts is evident from the names of several tribes, such as the Tupinambas, Tupiniquins, Tapiguas, Tum-mimiri, &c.; so that it became the most extended native idiom in South America, and was adopted by the Europeans, as well as by many heterogeneous tribes, as the medium of communication. Its analogy with the other branches of the same family and with the Caribbean aided its extension. Here also the style of female speech differs in some particulars from that of men. The Omaguas, formerly a most powerful association of tribes, were the Phœnicians of the Amazon, Japura, &c., being spread inland as far as the Rio Napo, on the affluents of the Orinoco, in Venezuela, to the S. in Solimoes, on the Para, &c. Their language differs from all others in South America. It is monosyllabic, has nasal and guttural sounds, no gender, and a very simple conjugation. The same word has many significations, according to its tone; reciprocal verbs are formed by the suffix *ea*, and active verbs from nouns by *ta*. It points to the Othomi as well as to trans-Gangetic languages. In the province of Para, between the Madeira and the Tapajos, the powerful Mundrucus and Tocantins speak a tongue which is akin to the preceding. Other tribes on the Amazon have idioms which are related to either the Guarani or the Omagua. There are grammars of the Guarani by A. Ruiz de Montoya (Madrid, 1639), and P. Restivo, from Bandini (1724). Montoya also published a vocabulary. —Between the rivers Doce and Pardo, and between the Atlantic and the province of Minas Geraes, we find the Botocodos, whom Southey derives from the south, 50 years before the arrival of Europeans, and who have a language of their own. Being deprived of the free use

of the lower lip by a custom, once almost universal, but now going out of fashion, of loading it with a wooden ornament, they utter many nasal and other peculiar sounds, although scarcely any gutturals; they use a great many vowels, but confound many articulations, as *t* and *d*, and *l*, *n*, and *r*, together; for instance, *Taru*, or *Talu*, God. Most of their words are monosyllabic. They have many onomatopœias and various figurative expressions, and they double many words; thus, *nac-nac*, sea gull; *eng-eng*, woodpecker. There are two cases, nominative and oblique, as *taru-ti-po* (courser of heaven), the sun; *taru-niep* (heaven-rest), the moon. The plural and comparative are denoted by *ruhu*, more; the superlative by *yikaram*, most. In conjugation there are two moods, infinitive and participles. There is no substantive verb; thus: *he mung*, he gone; *e reha*, it good, &c. Among the Brazilian tongues is that of the Camacans on the river Pardo, in the province of Bahia, with extremely long words, very abrupt peculiar final sounds, and many gutturals; and that of the Macharis in Porto Seguro, with most peculiar palatals and many nasals. For materials on the Brazilian languages, see the works of Lery (1573); Mimiari, on the Kiriris (1695); F. de Azara (1781); Prince Maximilian of Newwied (1815-'17); Spix and Martius (1817-'20); Von Eschwege's vocabularies of the Puris, Coroados, Coropos, &c.; and the travels of D'Orbigny and Augusto St. Hilaire.—The Araucanian or Chilidagu, Chili language, formerly extended more northward, and is spoken by the Moluches (or Aucas), consisting of the Picunches, from Coquimbo as far as Santiago, by the Puelches about Mendoza (E. of the Cordillera), by the Huilliches on the Biobio and Valdivia, and by the independent Aucas in the south of Chili, with dialectic variations. This is probably the most harmonious and the most cultivated language among the indigenous races; its purity and elegance being so cherished, that even a preacher is often upbraided by his hearers if he commits a solecism in his sermon. It is written with the whole Spanish alphabet, and has beside a nasal *n* and *u* as in French. In the north, *d* and *r* are used for *s*, and conversely in the south. Words end in vowels and in the mild consonants, *b*, *d*, *g*, *f*, *l*, *m*, *n*, *r*; only about 20 in *s* or *z*. There is no gender; the signs of sexes are *alea*, male, and *domo*, female. The cases are three: *ni*, genitive; *mo*, *meu*, ablative; *engu*, instrumental. Dual, *engu*; plural, *ica*, *engn*, or by prefixing *pu*, or intercalating *que* between adjective and substantive. Persons: *inche*, I; *eimi*, thou; *tepe*, he; dual: *eimu*, 1st; *eimi*, 2d; *teyenga*, 3d; plural: *inchin*, we; *eimn*, you; *teyengn*, they. Personal suffixes to verbs: 1, *n*; 2, *imi*; 3, *i*; dual, *yu*, *imu*, *ingu*; plural, *in*, *imu*, *ingu*. The imperfect tense is formed by intercalating *bu*, the past perfect by *uye*, the pluperfect by *uyebu*; future, 1st, *a*, 2d, *uyea*; aorist, 1st, *abu*, 2d, *uyebu*. The infinitive ends in *n*; gerunds in *yum*, *al*, *yabum*; the participle active in *lu*, passive in

el; the conjunctive in *li*, optative in *liehi*; passive voice in *ngen* (thus, *aiün*, to love; *aiün-gen*, to be loved); negation intercalates *la* (imperative *qui*, conjunctive *no*), &c. Adjectives are formed by the suffix *geti*. There are more than 20 forms of transition for all sorts of modifications in the verb (more than in the Altaic languages). In short, some of the best traits of the Indo-European and the polysynthetic languages are combined in the Chilidngu. It has geometrical terms, and is skilfully employed as a rhetorical and poetical idiom. There are grammars and vocabularies by L. de Valdivia (Lima, 1608), A. Febres (1765), and B. Havestadt (Münster, 1777). The tribe of the Boracanos is almost white.—The brave and gigantic Patagonians (Tchuelhets) are divided into several tribes, such as the Tchuel-cunny (South-men), Tchuan-cunny (North-men), &c. Pigafetta collected some of their vocables. It is supposed that an idiom similar to theirs is spoken by the Yacanacus, who inhabit Terra del Fuego and the southern margin of the continent, as well as the Brunswick peninsula, whom Bougainville named Pecherai (fishers), and whose idiom Weddell believed to resemble the Hebrew. See Ludewig, "Literature of American Aboriginal Languages," with addition (London, 1858).

INDICTMENT. In the old law books this word is written endictment and enditement; and it is said to be derived, through the French *enditement*, *enditer*, from the Latin *indicare*, to point out; or, as some suppose, from *indicere* and *indictus*. An indictment is defined by Judge Story, in his "Commentaries upon the Constitution," to be "a written accusation of an offence, preferred to, and presented upon oath as true by, a grand jury at the suit of the government." Indictments are to be preferred in criminal matters, and in those alone which concern the public welfare. They lie then for all treasons and felonies, for all misprisions, that is, concealments of treasons and felonies, and for all misdemeanors of a public nature. Among such misdemeanors may be mentioned, for example, disturbances of the peace, assault and battery, libels, perjury, conspiracies, and public nuisances. So, too, whatever outrages decency or is injurious to the public morals is an indictable misdemeanor. Upon information by parties who are cognizant of the criminal acts alleged, an indictment is framed by the proper prosecuting officers, and laid before the grand jury. If the jurors, after hearing the evidence, do not find "a true bill," the party, if in custody, is entitled to be discharged without further answer. If the bill, on the contrary, be found to be a true bill, it is returned into court, and the party stands indicted and may be required to answer to the charges made against him. (See *JURY*.) In respect to its form, the indictment is intended to be a plain and certain narrative of the offence charged, and of the necessary circumstances that concur to ascertain and define the fact and its nature. It can perhaps be no longer made a reproach to the law that it demands, in the words of

Chief Justice Hale, "unseemly niceties" in the framing of indictments, and yet the reason for and requirement of singular exactness still remain. In the first place, it is the plain right of the accused to know that he has been legally indicted. To this intent, the bill must show with reasonable certainty that it was presented to and proceeds from a court of competent jurisdiction in the case; that the place where it was found was within its jurisdiction; and lastly, that it was found upon the oaths of at least 12 jurors, who must further appear to have been of the county or other limits of the court's jurisdiction. The insertion of the jurors' names is not necessary. The indictment must be certain as to the name of the accused, and should repeat it with every distinct allegation. In general a mistake in the name is fatal, though a mere misspelling of it, if the sound be rendered aright, may not vitiate the indictment. The defendant must also be described by his profession or occupation, and with the addition of the town or city and county of his residence. If several joined in the commission of the offence, as in assault or robbery, all may be joined in the bill, or each may be indicted separately. Yet when the crime is in its nature distinct and individual, as perjury or the utterance of blasphemous or seditious words, there can be no joinder, though several were guilty of the same offence. The time and place of every material fact must be distinctly averred. Generally, however, it is not necessary to prove the commission of the offence at the precise place and time laid. It is sufficient, if it appear to have been committed within the jurisdiction of the court, and on any day previous to the finding of the bill, if that fall within the period during which the offence may be prosecuted. If however the time or place is an essential element of the crime, a variance in either respect between the charge and the proof is fatal. If it be necessary to cite written instruments, their dates must be truly stated. The date is also material when a period for preferring indictments is prescribed by law, or when statutes of limitations are involved. In the statement of the offence, the indictment must recite explicitly the facts which constitute the alleged crime, and not merely their supposed legal bearing. It is the simple office of the bill to exhibit the facts. If there be sufficient to constitute the crime charged, that will be judicially recognized by the court as their legal consequence. A particular offence must be alleged. To charge the defendant with one of two offences disjunctively, as "forged or caused to be forged," is insufficient; and so it is to describe him as a general offender, as "common thief" or "common slanderer." Yet one may be indicted as a "common barretor," or as a "keeper of a common bawdy house," for in these cases the habitual character makes the particular offence.—In the description of some crimes certain technical words and terms must be employed; thus, "traitorously" in indictments for treason, and "feloniously" in all charges of felony; "kill

and murder" in charging murder, and "took and carried away" in a case of simple larceny. In indictments under statutes it is sufficient to describe the offence in the words of the statute. The indictment must conclude in the prescribed form, where that is given by the state constitution. It is generally in the words, "against the peace and dignity" of the state or commonwealth.

INDIES, EAST. See EAST INDIES.

INDIES, WEST. See ANTILLES, and WEST INDIES.

INDIGO, a vegetable dye stuff of great importance, known to the ancients by the name of *indicum*, from its being brought into Europe from India. The same name appears also to have been applied to the article India ink, but in this case usually qualified by the epithet *nigrum*. So little was known of the real nature of this substance, which for centuries had been employed in painting and dyeing, that as late as the year 1705 it was spoken of as a mineral in letters patent issued in Halberstadt, in Germany; and this notwithstanding the correct but discredited observations of Marco Polo made in the 13th century. The use of indigo in dyeing was probably introduced into Italy as early as the 11th century. As the art was improved by the Italians, indigo took the place of the native woad. With the establishment of direct trade with India by sea, supplies of the article were more easily obtained, and after the discovery of America a similar product was brought from the new world. Francisco Hernandez speaks of it as in use by the Mexicans, the pigment being called by the names *mohuitli* and *tleuohuitli*, signifying the same as the Latin name for the article, *cæruleum*. In the beginning of the 17th century the importations of indigo from the East Indies into Holland assumed no little importance. In 1631 there was brought by 7 vessels 333,545 lbs., estimated to be worth \$500,000. Three ships that arrived in April, 1633, brought indigo valued at 2,046,000 rix dollars. Its introduction was a matter of great complaint by the Germans on account of its superseding the indigenous woad. Its use was prohibited by the diet in 1577, and the article was denounced under the name of the devil's dye as a pernicious, deceitful, corrosive substance. The people of Nuremberg, who cultivated woad, enacted a law compelling the dyers to take an oath annually not to use indigo, and this they were still obliged to do long after the dye was in universal use. By the French government the use of indigo was forbidden in the province of Languedoc in 1598, and the law was long enforced. A similar outcry was raised against it in England in the reign of Elizabeth, and in 1581 it was condemned by act of parliament, and persons were authorized to search for and destroy it and logwood also in any dye house. This law remained in force nearly a century.—Indigo is a product of numerous plants, belonging to the order *leguminosæ*, and indigenous to the tropical regions of Asia, Africa, and Amer-

ica. The genus *indigofera* contains at least 60 species which yield it, of which the *tinctoria* produces the most, and the *pseudo-tinctoria* the best. The *I. añil* is the most productive of the American species. It is also obtained from other genera, as from the *isatis tinctoria* or woad of Europe, *nerium tinctorium* of Hindostan, *Wrightia tinctoria* of the East Indies, *baptisia tinctoria* of the United States, and many others. These plants contain the coloring principle in their leaves, in the form of a colorless substance which is brought out and rendered apparent by its oxidation as the leaves dry, or is developed by submitting green leaves to a process of fermentation and oxidation. The *I. tinctoria* is cultivated both in the East and West Indies. It grows to the height of 4 or 5 or even 6 feet, in a bushy stem proceeding from a root about $\frac{1}{4}$ of an inch thick and a foot in length. The leaves are pinnate and the flowers papilionaceous, both these and the pods usually occurring with the leguminous order of plants. The seeds are sown in March and April in a light soil, and harrowed in. Weeds are removed when they appear, but after a few showers the plants cover the ground, keeping out all other vegetation. Before they have reached their full height the plants should be cut, always early in the morning, and carried the same day to the factory. Here they are laid at once in a great stone cistern some 20 feet square and 3 feet deep, capable of holding 5,000 to 8,000 lbs. of plants. Hurdles are placed upon them, and heavy beams are laid across these and secured to the sides of the vat, the object being to keep the plants down when they swell. Water is then admitted so as to cover the plants. Fermentation soon commences, and may be allowed to go on for 10 to 14 hours, according to the condition of the plants, the temperature, and weather. The liquor is in commotion as if boiling; frothy bubbles rise to the surface, and their color, first white, becomes grayish blue and then deep purple, and finally a copper-colored scum covers the surface. When the agitation subsides the liquor is drawn off into a lower vat; and the beams and hurdles being removed from the upper one, the steeped plants are taken out to be dried for fuel, and the vat is prepared for another charge of fresh plants. Into the lower cistern a number of men, commonly 6, enter and beat up the liquid with their hands or with paddles till the coloring matter begins to appear in small atoms. This may require $1\frac{1}{2}$ hours. The appearance of a precipitate fine as small sand, leaving the water clear, indicates favorable progress; the beating is then discontinued, and the vat is left a few hours for the indigo to subside. The liquor is then run off from an upper vent, and after this the indigo from a lower one; or the latter is sometimes left in part as the water is drained away, and is then gathered up by a person entering the vat for the purpose. Lime and gunn have been employed to hasten the precipitation, but their use is considered objectionable from their supposed

injurious effect upon the quality of the indigo. The pulpy precipitate is next freed by standing in another cistern from more of the water mixed with it, and is then passed through a strainer into a boiler, in which it is heated to ebullition, and by some kept boiling for 5 or 6 hours. Being freed from scum, it is drawn off into a vat, from which, after subsiding, more water is taken off the top, and the rest is removed to the dripping vat, a wooden case having its floor perforated with holes and covered with a woollen cloth. The liquor passes through this filter, and the operation is completed by subjecting the residue to the action of a press, which causes it to be left behind in a square cake of the shape of the case which contains it. This cake retains its form when the sides of the case are removed, and being thus exposed it is cut by a wire into 64 square blocks. These are laid out upon hurdles to dry in the shade, and left for several days or weeks locked up in the drying house before packing. By the other method the leaves separated from the stems are dried in the sun, and then stored. When a large quantity is collected they are infused with 6 times their bulk of water, and stirred for 2 hours till the leaves all sink. The liquor is then drawn off, beaten, and further treated as in the process already described.—The Asiatic commercial indigo is brought from the several ports of India, and from Java and Manila. It differs much in quality and in shades of color. The best Bengal indigo shipped from Calcutta is the superfine or light blue, in cakes of cubical form, so light as to float upon water, friable, soft, of clean fracture, and of beautiful copper color when rubbed with the nail. Other qualities are of shades of violet, red, and copper color. The African indigos from Egypt and Senegal are fine blues, but generally contaminated with earthy matters. The best of the American qualities, as some of those from Guatemala and Caracas, are equal to the best Bengal. These countries furnish a considerable portion of the indigo of commerce. The southern portion of the United States exported annually in the early part of the present century about 134,000 lbs. of indigo, worth 62 cts. per lb.; but the product has now fallen off, so that only about \$3,000 worth is shipped. The shipments from the East Indies are estimated at 13,000,000 lbs., worth there from 50 cts. to \$1.25 per lb. The value of the imports into the United States in the year ending June 30, 1858, direct from the British East Indies, was \$400,000, indirect *via* England about \$200,000, and from the Philippine islands over \$280,000; total value of the imports, \$945,083. Of these, about \$400,000 worth was reexported, chiefly to Belgium and Germany. The imports of England and France are rated at about \$6,000,000 worth each. The natural advantages of the southern states for the crop are regarded by many as quite equal to those of India; and its culture is strongly advocated by some in order to multiply the resources of the country. (See De Bow's "Industrial Resources," vol. iii. p. 50).—The

coloring matter of indigo, called pure indigo or indigo blue, usually constitutes nearly 50 per cent. of the commercial article, which may be obtained, as Chevreul recommended, by dissolving out what is soluble in boiling water, then that which alcohol will remove, and finally what hydrochloric acid will take up. The residue is pure indigo, and any silica that may be present. Various methods are adopted by different chemists for determining more exactly than by the above rude process the proportions of indigo blue in samples of indigo, some reducing the coloring matter by deoxidizing agents to indigo white, which is supposed to have been its original condition in the plants, and then precipitating and collecting this. Thus Dr. Dana dissolves the indigo by boiling in caustic soda with cautious addition of protochloride of tin; the insoluble portion being then separated, bichromate of potash recovers and throws down the indigo blue, which when washed with hydrochloric acid is collected and weighed. Others adopt the plan of first taking up impurities by a succession of appropriate solvents; these impurities are chiefly resinous and gummy matters. The pure indigo has also been obtained by another process dependent on its property of volatilizing at the temperature of about 550° F., and condensing in needle-shaped and prismatic crystals. The operation is hastened by mixing the indigo with water and twice its weight of plaster of Paris to a paste, which is spread on an iron plate. Heated over a spirit lamp, the steam and vapor of indigo separate together, and the latter collects in beautiful velvety crystals upon the surface of the mass. The pure substance melts nearly at the temperature at which it sublimates, and is also charred and decomposed at about the same. It also ignites and burns with a bright flame, giving off much smoke. The crystals have a beautiful and intense copper color, and when in thin plates they present by transmitted light a splendid blue. Their composition is represented by the formula, $C_{16}H_8O_2N$. The substance resists in a remarkable degree the action of the ordinary solvents (sulphuric acid excepted), unless it be first deoxidized, when it readily dissolves in alkalis. The conversion into colorless indigo, though called oxidation, appears to be rather an accession of an atom of hydrogen, which, according to Liebig, unites with one of the oxygen present, giving to the compound the composition of a hydrate, represented by the formula, $C_{16}H_8NO + HO$, the indigo blue in this case being an oxide of the same body, $C_{16}H_8NO$. The facility with which the change is effected, and the readiness with which the indigo regains its blue color and insolubility by exposure to the air, admirably adapt the substance for use as a dye. It is applied in the solvent state to the fabric steeped in the liquid; and when the cloth is exposed to the air, the insoluble substance is developed with its characteristic color and fixed in the fibres.—Sulphuric acid dissolves indigo blue without changing its color to red,

the usual action of acids upon vegetable blues; and when the substance is digested for 3 days with 15 parts of concentrated sulphuric acid, a deep blue pasty mass is obtained, which dissolves completely in water, and under the name of sulphindyllic acid, or more properly hyposulphoindigotic acid, is often used in dyeing, and also in the manufacture of the blue inks. Many other beautiful and highly interesting bodies result from this chemical change, and still more from the oxidation of indigo blue; and still another series from its treatment with the alkalies. These have received much attention from eminent chemists, and are particularly treated in Dumas' *Traité de chimie appliquée aux arts*, vol. viii., in Brande's "Manual of Chemistry," and in Muspratt's "Chemistry."—Indigo has been introduced as a remedial agent in medicine, especially in epilepsy, hysteria, infantine convulsions, and other diseases, but whether with advantageous results is questionable. Its physiological action appears to be that of an irritant to the alimentary mucous membrane.

INDIGO BIRD (*Cyanospiza cyanea*, Baird), a North American finch of a blue color, tinged with ultramarine on the head, throat, and middle of breast, and elsewhere with verdigris green; lores and angle of chin velvet black, and wing feathers brown edged with bluish brown. The length is about $5\frac{1}{2}$ inches, and the extent of wings $7\frac{1}{2}$; the female is smaller, and of a yellowish brown color, with the wings darker. It is found in the eastern United States, as far as the Missouri, and south to Guatemala; it arrives in the southern states from Mexico and Central America about the middle of April with the painted finch (*C. ciris*), and like this is caught in traps for sale. It prefers open places on the edges of woods; perched on the top of a high tree, it delights to sing its clear and sweetly modulated strain, consisting of 8 or 10 notes. Though less handsome than the painted finch, its shape is elegant and compact, and its manners very lively, so that it is in request as a cage bird. The nest is made among the rankest grass, and the eggs, 4 to 6, are blue, with a spot or two of purple on the larger end. They migrate southward in the autumn. The food consists of small seeds and insects.

INDO-CHINA, that portion of Asia which lies between Hindostan and China, or between lat. 7° to 26° N. and long. 92° to 108° E. It was formerly called Further India, or India beyond the Ganges. Its present name is derived from the fact that part of this region was once subject to China, and its population exhibit many characteristics both of Chinese and Hindoos. Tibet and Assam bound it on the N., China on the N. E., and Bengal on the N. W. In every other direction it is bounded by the ocean, with the exception of a narrow isthmus to the S. which connects it with the Malayan peninsula. Its area is estimated at 1,000,000 sq. m. Buddhism is the prevailing religion. The principal political divisions are Burmah,

Siam, Laos, Anam, and the British provinces of Aracan, Pegu, and Tenasserim, all of which are described in separate articles.

INDO-CHINESE LANGUAGES, the tongues spoken in the Trans-Gangetic peninsula. The nations S. of Assam, Thibet, Yun-nan, and Quang-si, and N. of the Malayan peninsula, form a group of transition between the Caucasian, Mongolic, and Malay races. In language they are related to the Chinese and Tibetans, and in religion, being Buddhists, to ancient India. There are 4 groups. I. The Burmese (Marama, Mramma, or Miamma, pronounced Byamma). The Chinese call them So-mien, and give their empire, which was formed by the conquest of Siam, Aracan, and Pegu, the name of Mien-tien. They dwell along the upper and middle course of the Irrawaddy. A dialect of their language is spoken in Aracan (Rakhain, pronounced Yakhain), whose inhabitants are called *Mug* (saint) by the Bengalese. A sub-dialect is spoken on the island of Cheduba. The Aracan dialect is richer than its neighbors in Pali elements. Another dialect of Burmese in Pegu (Moan), between the Irrawaddy and the Salwin, was originally a different language, rich in literature. A similar idiom is said to exist on the island of Carnicobar. Other dialects are those of the Yo (Ro) tribes in the northern mountains, resembling that of Aracan; Taneng-sari in Tenasserim, on the W. coast of Siam, with many ancient words; Passuko, Moplu, Kuki (almost like the Burmese), &c. Most of these dialects contain many Thibetoid polysyllabic words, which are uttered *staccato* as if they were phrases of monosyllables; for the rest of the words are monosyllables. Although the Burmese and its dialects contain many gutturals, nasals, and 6 aspirates, they are melodious, and sentences close with a musical cadence. Tones or synonyms determine many significations. There are many tropes and periphrases. *Sii* signifies, for instance, light and beauty, *sii-pak* beauty-mouth, *i. e.*, lips; wood-glory means flower; weight-child, little weight, &c. Montegatio supposes that there is a combination of languages; for the articles, numerals, &c., are twofold. The conjugation and other flexions are poor. Clearness of speech is supplied by great circumlocutions, especially in the idiom of etiquette toward superiors. The best works on the language are: Carpanius, *Alphabetum Barmanum Regni Ava* (Rome, 1776); Paulino a S. Bartolomeo, *Musei Borgiani Codices Peguenses, Siamenses*, &c. (Rome, 1793); Francis Buchanan "On the Languages of Burma;" Charles Lane, English and Burmese dictionary (Calcutta, 1841). II. Siamese (Thai, freemen; called by the Burmese, Chinese, &c., Shan, and by the Avans Myetaphshan or Siüan). They are the most civilized people of eastern Asia. Within the northern part of that area is Laos (a part of which belongs to the following group), from which both the Burmese and the Siamese received Buddhism, laws, and other institutions. This group contains the following languages and

dialects, viz. : 1, of the Thai-jhai (great Siamese) in Laos, substituting *h* and *d* for *r* and *l* of the next group, with the oldest and richest Pali literature, and enriched by many Burmese and Pali words; 2, of the Thai-noi (little Siamese), on the lower course of the Meinam and on the gulf of Siam; 3, of the Moy-thai, on the table-land of Muneeppoor in the N. of the Burman empire, to the valley of the Bralmapootra on the W., and on the boundary of Yun-uan in the E., i. e., in the greater part of the old kingdom of Cassay, where they are called Muggalu (corrupted by us into Meckley) by the Bengalese; 4, of the Lok-thai (Chin. *Pe-i*) and Muang-ping-djing-mai (or Lolo, Chin. *Pa-pe-si-fu*), in two principalities of Laos; a dialect of the once learned and powerful Thai-lung, near Cassay. A dialect is also spoken near Pegu, another on the island of Junk-Ceylon, and in the Mergui archipelago. These dialects consist almost entirely of monosyllabic words; the many Pali and Sanscrit words are more altered than by the Burmese. There are also many Chinese, and especially Cantonese words in them. The graphicsystem is derived from the Devanagari, and contains 37 characters for consonants, 14 for vowels, and 6 for diphthongs, beside signs of tones. Specimens: *rau pen*, I am, and we are; *tang tang lai pen*, all ye are; *mua tang ma, rau kin sam red leu*, time you come, I already eat cease have—i. e., when you came, I had already eaten. The Siamese is very rich in forms of etiquette, using 8 words for I and we, which are graduated by the importance of the person spoken to. See Capt. James Low, *Siamese grammar* (Calcutta, 1828), and D. J. Pallegoix, *Grammatica Lingue Thai* (Bangkok, 1850).

III. Anamese (peace-people; Chin. *Ngan-nam*). The language is spoken in 5 provinces: 1, Tonquin, in which it is purest; in the district of Lactho there is a peculiar rude dialect; 2, Cochinchina (Chin. *Kun-tehng-tehng*, kingdom of Tchiampa), the people of which are a mixture of descendants of a Chinese colony of about 500,000, who settled on the Mekiang 215 years B. C., with the ancient inhabitants; 3, Cambodia (Chin. *Kan-fa-tehe*), the inhabitants of which call themselves Cammer, speaking a dialect of the general language; 4, Laos (Chin. *Mein-lao*), divided between the states of Burmah, Siam, and Anam; the people in the southern region call themselves Lanjan; 5, Chiampa (Gia-dinh-pha, or Tchien-tham-bo), or Loi, M'loi, once a powerful state, whose inhabitants formerly dwelt in Java, and now inhabit the interior mountains; the dialect of this southern district differs very much from the general language. This general Anamese language has many roots of its own, especially the names of natural objects. A very great portion, however, consists of such as Chinese words, more or less altered in tone or in signification. It differs, on the whole, no more from the Chinese Mandarin speech than does that of Fo-kien. The characters used in writing amount to about 3,000 sino-

grams, somewhat altered or differently applied, and mixed with *An-nam-tse* (Anam letters) of Anamese formation. The monosyllabic words have generally 5 tones (descending, grave, falling, asking, acute), beside the plain sound; thus, *ma* signifies, according to intonation, but, curse, horse, sepulchre, or cheeks; *ba ba ba ba*, variously sung, constitutes the phrase: "Three lords presented (something) contemptible (to the) forsaken lady-love (of the) prince." Vowels abound, and many words end in consonants, as in the Canton dialect. The grammar and construction are like the Chinese. Numerals: *môt*, 1; *hai*, 2; *ba*, 3; *bôn*, 4; *nam*, 5; *sáu*, 6; *báy*, 7; *tám*, 8; *chín*, 9; *müôi*, 10; *hai müôi* (2 × 10), 20, &c.; *tram*, 100; *ngán*, 1,000; *müôn*, 100,000; *veo*, 1,000,000. They also employ Chinese numerals. Persons: *tôi*, I; *mãi* thou; *nô*, he. By prefixing *chúng* (much) to these they obtain our we, you, they. But the idiom of etiquette is nicely shaded; for the I of the king is *trám*, of superiors *tao min*, of inferiors only *tôi* (servant). Thou to equals is *anh* (brother), to superiors *ông* (master). See Alex. de Rhode, *Dictionarium Anamiticum, Lusitanum et Latinum* (Rome, 1671); Crawford's "Journal of an Embassy to Siam," &c. (London, 1828); Pigneaux and Taberd, *Dictionarium Anamitico-Latinum*, with a grammar (2 vols., Serampore, 1838). IV. Remnants of ancient tribes, living among the mountains, with dialects of the aboriginal languages, or such as are not yet sufficiently explored. Such are the half savages Kian, in the N. W. of Burmah; Kuriang (Karens), between Ava and Pegu and in the north, with a very sibilant tongue; Play (Tong-su), in the delta of the Irrawaddy; the Zahaing, &c.; and various tribes converted to Buddhism and half civilized, as Tchong in Siam, Moi (Ke-moy), almost black, a principal people in the N. E. of Cambodia, &c.

INDO-EUROPEAN LANGUAGES, one of the principal families into which the tongues of mankind are divided by linguists. This title, though not exactly appropriate, is preferable to Indo-Germanic, Japhetic, or Mediterranean. Chr. Lassen proposed the term Aryan, as opposed to that of *Mlech'ch'ajati* (barbarian, outcast; see BRAHMA, vol. iii., p. 616). This linguistic class almost coincides with the ethnio of Blumenbach's Caucasian race. It consists of the following three groups: A. The Asiatic, with two branches, viz. : 1. The Aryan, or Cis-Gangetic Indian, headed by the Sanscrit, the sacred language of the Brahmins, probably never altogether vernacular, and now also the sacred language of the Thibetan and Chinese Brahmins. Probably coeval with this or its earliest offspring, the Pali, the idiom of Buddha, is now employed in religious rites and books by the Buddhists of the Trans-Gangetic peninsula (see INDO-CHINESE LANGUAGES), as well as by those of Ceylon, China, and Japan. The Pracriti (procreant, natural, vernacular, worse) vernacular consisted of several dialects, such as the scenic Sauraseni, Magadhi, &c., especially the

dramatic, which arose among the Maharashtras and Jains. (For the languages or dialects now spoken in India, with the exception of the Dravidan, see INDIAN LANGUAGES, ASIATIC.) The Sanscrit also produced the Malayized Kavi (poet) language of Java, and exerted even in the remotest times an influence on the Malay as far as New Zealand and Madagascar. 2. Iranian or Medo-Persian, whose prototype is the old Bactrian or Zend, more ancient than the Sanscrit, the sacred idiom of Zoroaster and the Magi. The Pazend was a dialect of this language. The Pehlevi (or Huzvaresb), the court language of the Parthians, was affected by Semitic influence. The principal idiom of the Achaemenian inscriptions (see CUNEIFORM INSCRIPTIONS) must have prevailed over the greater part of the Iranian highland. The Parsee, used at the court of the Sassanides, probably living yet among the Guebres, developed itself about the beginning of our era, supplanting the Pehlevi, and, being altered by the Arabic, has produced the Neo-Persian. This is the most polished of the living languages of Asia, was the court language of the Great Moguls before the Hindostanee, and is spoken beyond Persia proper, in Turkestan and many neighboring countries. The Iranian element seems to have been an important constituent in the Semitic tongues of Assyria and Babylon. The languages of the Afghans and of the Koords, as well as those of the Belooches and of the Ossetes, Lashans, Lesghians, Tcherkesses, &c., tribes of the Caucasus, are not yet sufficiently known to allow of a strict classification. The Armenian (Haik), Georgian, &c., have some analogies with the Aryan. How far the ancient idioms of the Asiatic Pelasgi and Leleges, those of the Phrygians, Lydians, Carians, Mysians, Lycians, and Caunians, Pamphilians, and Matieni, were connected with the family under consideration, both among themselves and with its branches of Europe, is not yet ascertained. B. The group of S. W. Europe is called Thraco-Pelasgian by some linguists, without a definite conception either of its signification or extent, and is coordinated with the Celtic. The ancient languages of Thrace, Mæsia, Thessaly, Macedonia, Epirus, and Illyria, still await their *Ædipus*. To the Thraco-Pelasgian belong the two most illustrious of all tongues, the Greek and the Latin (which see). We will here point out the so called daughters of the Latin, which are: Italian, Roumanic (Wallachian), Provençal, Spanish, Portuguese, Rheto-Romanic (or Ladinic, spoken in the valleys of the upper Rhine and Inn), and French. See L. Diefenbach, *Ueber die Romanischen Schriftsprachen* (Leipsic, 1831); C. S. Schweizer, *Formationes Lingua Romana Rustica*, &c. (Jena, 1839); Fr. Diez, *Grammatik der Romanischen Sprachen* (Bonn, 1836-'44), and *Etymologisches Wörterbuch der Romanischen Sprachen* (1853). The Celtic branch is treated in our articles on the Bas-Breton, Gaelic, Erse, Irish, and Welsh languages. C. The group of N. E. Europe, consisting of two branches, viz.:

1. The Teutonic or Germanic in a wide sense, which may be divided into four categories, to wit: *a*, the ancient or Gothic, akin to the Gepidic, Burgundian, &c.; *b*, German in a more restricted sense, subdivisible into Franco-Theotistic, Alemannic, Frisian, &c.; *c*, Scandinavian (see DENMARK, ICELAND, NORSE, and SWEDEN); *d*, Germano-Norman or English. 2. The Lithuano-Slavic (properly Litvino-Slovenic), wrongly called Sarmatic languages. The Lithuanian and its nearest kindred, the Lettic, also pass under the denomination of Baltic-Slavonian, and were formerly widely extended toward the S. and S. W., reaching the Gothic settlements. The organic forms of this language approach nearer the Sanscrit than even the old ecclesiastic idiom of the Slavi. In later times it has been corrupted by German, Finnic, and Slavic; so that the Esthonian are sometimes classed with the Tschudes. Lettic prevails between the Curische Hafl, the gulf of Finland, and Lake Peipus, and is mingled with Polish, Russian, and Teutonic elements, in the regions of the lower Düna, Niemen, and upper Pregel. The dialect of the Prussians (Pruczi) became extinct in the 16th century. The Lithuanian is distinguished into Prussian and Samaitian (of Samogitia, formerly a Polish province), the former being spoken in E. Prussia, in the regions of Memel, Tilsit, Ragnit, Laban, Insterburg, in a part of ancient Poland, and in Lithuania. (See LITHUANIA, LANGUAGE OF.) The Slavic languages, which will be treated in a separate article, extend from their contact with the German tongues and with the Finnic, Italian, Magyar, Skipetar, Wallachian, Greek, and Osmanli, in Europe, skirting the Tartaric, Thibetan, Mongolic, and Mantchoo areas, partly interrupted by the Finnic and Tartaric, over the Russian empire, even into North America; occupying a great portion of Austria, Turkey, and Prussia, and parts of Germany. They are separated into two areas, viz.: *a*, that of the Antes or eastern Slavi, comprising the following peoples: Russians and Rusniaks (Rutheni), Illyrian Slavi (Bulgarians, Bosnians, Servians or Rascians, Croats or Horvaths, Slavonians, Dalmatians, Czernogorezi or Montenegrius, Carnians or Carniolians, Crainians or Carinthians, and Styrian Wends); *b*, that of the Slavini, or western Slavi, viz.: the Poles (Lechs, Ljachi), together with the Masures, Cassubes in Pomerania, Goralci (mountaineers) in the Carpathians, the Bohemians (properly Cechs or Czechy), with the Moravian Hannaks, the Slovaks of Hungary, the Sorbo or Sorabo-Wends with the Lusatians, the Hallores in Saxony and Prussia—on the upper Spree, between the sources of the Black Elster and of the Neisse, in the Spree forest, and on the left side of the lower Elbe, on the Jetze. The works of P. J. Schaffarik, Joachim Lelewel, Dombrowski, Linde, &c., treat this subject in detail. Imbedded within the areas of B and C are the languages of the Euscaldunac (see BASQUES), Magyars (see HUNGARY), Suomalainen (see FINLAND), Skipetars or Albanians,

and Osmanlis or Turks, and the Arabic of Malta; all of them of a parentage different from the Indo-European. In all these languages and dialects, amounting to about 35 in Asia and to about 30 in Europe, the common roots and the common organic type are deducible by means of a comparison and by a scrutiny of the laws of the human mind, of our organs of speech and of hearing, on the one hand, and of the laws of natural objects and phenomena. The so called mother of this family has distributed her property among all her children, without having granted the whole treasure exclusively to any. The Celts first departed westward, probably before the Aryan branch had split into Indian and Iranian; and at different times divisions and subdivisions have taken place in all the groups. The Indo-European family of languages surpasses all others in the following characteristics, in which each branch more or less shares. It is well suited for the formation of derivatives from its roots; it adapts itself readily to logical or grammatical categories, and it therefore accommodates itself to conveying the nicest shades of meaning. Produced by the most gifted race, in the most favorable area for human life and action, it has reciprocally aided in the development of that race above all others.—See Sir William Jones, in the “*Asiatic Researches*,” Fr. Schlegel, *Ueber die Sprache und Weisheit der Indier*; A. W. Schlegel, *Indische Bibliothek*; J. Klaproth, *Asia Polyglotta*; Adelung and Vater, *Mithridates, oder allgemeine Sprachenkunde*; Dorn, *Ueber die Verwandschaft des pers.-german.-griech.-latein. Sprachsystems* (Hamburg, 1827); Balbi, *Atlas ethnographique*; Fr. Bopp, *Vergleichende Grammatik*, &c. (Berlin, 1832-’52); Schleicher, *Die Sprachen Europas* (Bonn, 1852); Pott, Benfay, Eichhoff, G. Curtius, Hofer, Prichard, Wiseman, Kuhn, Ebel, &c.

INDORE, a state in Hindostan in subsidiary alliance with the British, constituting the dominions of the Mahratta chief the maharajah Holkar, and consisting of several isolated tracts scattered over a large part of central India; aggregate area, 8,318 sq. m.; pop. 815,164. The largest and southernmost of these territories is bounded N. and S. E. by detached portions of the Gwalior dominions, N. E. by Bhopaul, S. by Candeish in the Bombay presidency, and W. by several petty native states. It is traversed E. and W. by the Vindhya mountains, and the Sautpoora range runs in the same direction along its S. border. The valley between these ridges is watered by the Nerbudda flowing W. The N. part of this tract, and most of the other portions of Holkar's territory, belong to the great table-land of Malwah. The N. districts are watered by the Chumbul and its feeders. The soil is generally fertile, producing wheat and other grain, opium, pulse, sugar cane, cotton, and tobacco. The inhabitants comprise Mahrattas, the dominant race, Bheels, Gonds, and a few Mohammedans. The Bheels are supposed to be the aborigines. They are one of the wild-

est people in India, but have sometimes been trained to make useful soldiers. The Gonds or Khoonds are a well built sturdy race, of a color varying from light to dark copper, and with intelligent countenances. They are fierce and barbarous in manners, dishonest, and much addicted to drunkenness, and until a stop was put to the practice by the British they frequently offered human sacrifices. On the other hand, they carry the virtue of hospitality to excess, and are good husbandmen. Their customary dress is a cloth bound round the waist, and hanging down like a skirt. They are numerous in all this part of India, and have given their name to the region of Gundwana, which extends S. from Indore. Holkar is bound by treaty to maintain a force of 1,000 men, commanded by native officers, to be at the service of the British in times of emergency. For the history of Indore, see HOLKAR.—INDORE, the capital of the above state, is situated in a plain on the left bank of the small river Kutki, 13 m. N. W. from the British military station of Mhow, 224 m. S. W. from Saugor, and 377 m. N. E. from Bombay; pop. about 15,000. It is an ill-built place, contains a few mosques, several Hindoo temples, and the palace of Holkar, and has no handsome edifices except the houses of the English inhabitants. The palace, which fronts on an open place, is over 300 feet square and 6 stories high, enclosing a court surrounded by pillars of black wood. Its style of architecture is impure Saracenic. The material used in its construction is granite, with ornamental work of wood. Some of the streets are tolerably spacious, and paved with granite slabs. The town is walled, but its defences are of no great strength. There is a British resident here. The present town is comparatively modern, the ancient Indore being on the opposite side of the river. Indore was plundered in 1801 by Sindia, and in 1804 it was occupied by a British force under Col. Murray, who surrendered it however on the conclusion of peace in the following year. On July 1, 1857, the native troops here rose against the English, in opposition to the will of the maharajah, and massacred a number of the civil servants, clerks, and women.

INDORSEMENT, or ENDORSEMENT (Lat. *in*, upon, and *dorsum*, back), literally, the putting of one thing on the back of another. Thus Milton, in the “*Paradise Regained*,” speaks of “elephants endorsed with towers.” In law, and in common usage, it means the writing of one's name on the back of an instrument; most commonly, a negotiable promissory note, or bill of exchange. (See EXCHANGE, PROMISSORY NOTE, and NEGOTIABLE PAPER.)

INDRE, a central department of France, bounded N. by Loir-et-Cher, E. by Cher, S. by Creuse and Haute-Vienne, and W. by Vienne and Indre-et-Loire; area, about 2,629 sq. m.; pop. in 1856, 273,479. The surface is mostly level, and presents 3 marked and distinct divisions: Bois Chaud, where the farms are small, and the scenery varied from the number of its

hedges, hedge rows, and woods; Champagne, a flat treeless region, without hedge or shrubby enclosure of any kind; and La Brenne, a low district, covered in part with shallow ponds, the mephitic exhalations of which are very unhealthy. The principal rivers are the Indre, Creuse, Claise, Aron, and Fouzou. The Indre, from which the department is named, rises in the department of Creuse, and joins the Loire after a N. W. and W. course of 124 m., for the last 44 of which it is navigable. The climate, except in the district of La Brenne, is mild and healthful. The soil is of various quality. The quantity of wine annually made averages over 6,000,000 gallons, about $\frac{1}{2}$ of which is exported. Several iron mines are in operation. Woollen cloth, linen, hosiery, porcelain, &c., are made. Capital, Châteauroux.

INDRE-ET-LOIRE, a central department of France, bounded N. by Sarthe, N. E. by Loir-et-Cher, S. E. by Indre, S. W. by Vienne, and W. by Maine-et-Loire; area, 2,360 sq. m.; pop. in 1856, 318,442. It is named from the rivers Indre and Loire, which unite within its limits. In the N. districts there are several barren arid wastes, and all over the department many extensive forests, the largest of which are those of Amboise, Loches, and Chinon. The chief rivers are the Indre, Loire, Creuse, Cher, and Vienne. The climate is considered one of the most delightful in France, being remarkable for its mildness and salubrity. The soil is in general extremely fertile. The quantity of wine annually made averages over 13,000,000 gallons. Iron and copper are found. Hardware, woollen cloth, and silk are made. Capital, Tours.

INDULGENCE, according to the doctrine of the Roman Catholic church, the remission of the temporal punishment, or part of the temporal punishment, which the repentant sinner, after having duly confessed his sins and received absolution, would have still to undergo either in this world or in purgatory. The guilt (*culpa*) and the eternal punishment incurred by every mortal sin are remitted by the sacrament of confession, and the Catholic church denies that it ever was her doctrine that indulgences could be granted for the remission of sins. As confession and absolution, or at least freedom from every mortal sin, are prerequisites of every indulgence, it is also contrary to the doctrine of the Catholic church to grant a remission of penalties to be incurred by future sins. Cases in which this distinction has not been observed are regarded by the church as a violation of her doctrine. The natural consequences of sin, such as sickness, are not counted among the temporal punishments remitted by an indulgence, as the church claims no power over them. Those ecclesiastical penalties which the church in former times used to impose on penitent sinners are regarded as a temporal punishment, and therefore as remitted by an indulgence. But Pius VI. rejected the opinion of those who considered indulgence as merely a remission of those ecclesiastical penalties. The

church claims the right of granting indulgences from the promise of Christ: "Whatsoever ye shall bind on earth shall be bound in heaven; and whatsoever ye shall loose on earth shall be loosed in heaven" (Matt. xviii. 18), this promise being unlimited, and therefore extending to the guilt of sin as well as the punishment. She finds an example of the granting of an indulgence in that passage of the New Testament (2 Cor. ii.) in which Paul at the request of the Corinthians remits to the incestuous man whom he had excommunicated (1 Cor. v. 3-5) the remnant of the penalty incurred for his crime. The same right is believed to have been exercised by those bishops of the earlier ages who restored apostates to communion, and abridged the time of their penance through the intercession of martyrs, and in virtue of their sufferings, joined to those of Christ. The strict discipline of the church was gradually mitigated, and the austerities enjoined by the canons abridged or commuted for works of charity and pious exercises, such as pilgrimages, visits to newly consecrated churches, and the like. In the 9th century the synodal courts consented that the ecclesiastical penance should be discharged by the payment of alms, of which the church was to be the dispenser. At the time of the crusades, taking the cross was particularly recommended as a substitute for the ecclesiastical penalties, and Urban II. granted at the assembly of Clermont (1095) a plenary indulgence to those who should join the crusade. In the 13th century the doctrine of indulgences was systematically developed by Alexander of Hales and Thomas Aquinas, the former of whom was the first to bring it into connection with the doctrine that all the good works of the saints, over and above those which were necessary toward a satisfaction for their own sins (*thesaurus meritorum*, *thesaurus supererogationis meritorum*) are deposited, so to speak, together with the infinite merits of Jesus Christ, in one treasury, the keys of which are committed to the pope. In granting an indulgence, the pope transfers a portion of this superabundant merit to particular persons, who satisfy with it the divine justice. Toward the close of the 13th century a report, the origin of which was unknown, prevailed in Rome, that according to a custom remembered by some very aged people a centennial indulgence might be obtained in the church of St. Peter on the occurrence of the jubilee year, 1300. Boniface VIII. was induced, by the vast concourse of devout persons who on this account thronged the city, to bestow upon all who in a penitential spirit should on this year of jubilee visit the churches of the apostles an indulgence for the sins of the whole previous life. Clement VI. (1342) decreed, in consideration of the brevity of human life, that the festival of the year of jubilee should be celebrated every 50th year. Urban VI. (1389) reduced the interval to 33, and Paul II. (1470) to 25 years. The indulgences, in the meanwhile, had become very frequent,

and the manner in which and the purposes for which (as the erection of churches, hospitals, and even purely secular establishments) indulgences were offered to the people, gave great offence to many. Not only did many of the dissenting denominations of the middle ages, as the Waldenses, Albigenses, and the followers of Wycliffe and Huss, make it a prominent mark of their opposition, but also many celebrated theologians of the Catholic church, as Berthold of Ratisbon, often called the Chrysostom of the middle ages; and Gerson objected particularly to the granting of indulgences for many thousands of years. The great religious movement of the 16th century sprang likewise from an opposition to the manner in which an indulgence granted by Leo X. for the erection of St. Peter's church was preached in Germany and Switzerland. The council of Trent, in its 25th session, issued a *Decretum de Indulgentiis*, in which it defined the doctrine of the church. It vindicates for the church of Christ the power of granting indulgences, and recommends the use of them as most salutary to the Christian people. It anathematizes those who assert either that indulgences are useless, or that the church has no power of conferring them. As to the abuses, it advises the bishops to inform themselves of them, and report them at the next provincial synod, in order that they may be brought to the knowledge of the pope, "whose authority and wisdom will then decree what is expedient for the church universal." After this definition on the part of an oecumenical council, an opposition to indulgences themselves could not well arise in the Catholic church; but nearly all those movements which primarily or secondarily had a decentralizing character, such as Gallicanism, Jansenism, and Febronianism, were directed also against several points in regard to the granting of indulgences, as to which it was especially urged that their number was too great, and the conditions on which the obtaining of an indulgence is made dependent were often too trifling.—Indulgences are either plenary, which remit the entire temporal punishment, or not plenary, which remit only a part. Among the former, the plenary indulgence granted at a jubilee occupies a prominent place. The latter are granted for a certain number of days, months, or years, in commemoration of the ecclesiastical penalties of the church which were formerly imposed for a certain length of time. An indulgence of 100 days, for example, is held to remit so much of the debt of temporal punishment as would be cancelled by performing 100 days of canonical penance. With regard to the persons to whom they are granted, indulgences are either universal, which can be gained by every member of the church, or particular, which are limited in extent, as to one bishopric, one religious association, or a single church. Numerous indulgences are granted to the members of all religious orders, associations, confraternities, and guilds, if they obey the rule and fulfil all

the prescribed duties. It is therefore customary for every newly formed religious association to apply to the pope to open to its members the treasury of indulgences. Very commonly indulgences are also attached to the veneration of relics, to reciting rosaries, to visiting privileged churches or altars, to the participation in certain festivals, to the wearing of scapulars, and also to a number of formulas of prayer. Of those indulgences which can be gained by every member of the Catholic church, a large number are pointed out in every Catholic prayer book. A list of those granted to the members of religious orders, confraternities, and associations, can generally be obtained from books or instructions published for the use of such associations. But a complete list of those granted to single churches, or altars, or localities, has never been published. The most complete list of indulgences granted to confraternities may be found in Bishop Bouvier's *Traité dogmatique et pratique des indulgences des confréries* (Mons, 1828). Many (not all) of the indulgences can be transferred to the suffering souls in purgatory, but they can be applied to them, as the scholastic theologians express it, not *auctoritative*, as an actual remission, but only *impetrative*, as prayers in their behalf. The doctrine of indulgences belongs exclusively to the theology of the Roman Catholic church, as neither the Protestant nor the eastern churches have it. Among recent Catholic works on this subject, that of J. B. Hirscher (professor at Freiburg in Baden), *Die Lehre vom Ablass* (Tübingen, 5th ed., 1844), is considered the best.

INDUS, or SINDH (Sans. *Sindhoo*, the sea; Pers. *Ab-Sind*), a river of Asia, rising on the N. side of the Himalaya, in Little Thibet, and discharging into the Arabian sea. Its remotest source is N. of the Kailas mountain, which the Hindoos regard as the mansion of the gods, about lat. 31° 20' N., long. 80° 30' E., nearly 320 m. S. E. from Leh, and not more than 100 or 150 m. N. W. from the source of the Sanpoo or Dihong, one of the principal feeders of the Brahmapootra. In its upper course the Indus is called Sing-kha-bab (lion's mouth) by the Thibetans, who believe that it flows from the mouth of a lion. It runs about 210 m. N. W. to the La Ganskiel pass, where it enters a deep valley between the Himalaya and Kuen-lun ranges, 5 m. from the Chinese frontier. Its elevation is here 14,000 or 15,000 feet, and its width, as observed by Trebeck, the companion of Moorcroft, was 180 feet in the middle of November. In the next 150 m. it has a fall of nearly 5,000 feet, its descent from its source to Leh being 8,000 feet, or 22 feet per mile. At Kolutzi, 480 m. from its source, it is only 60 or 70 feet wide, its waters having been partially absorbed by the arid country through which it flows. About 55 m. below this it receives the river Dras from Cashmere, and at the fort of Karis, lat. 35° 11' N., long. 75° 57' E., 47 m. below the Dras, it is joined on the right by the large river Shy-yok, which at the point of confluence is 450 feet

wide, while the Indus, although of greater volume, is 240 feet wide. It here loses the name of Sing-kha-bab, and is known as the Aba Sinde, or Indus proper. At Makpon-i-shagaron, 115 m. below Karis, it emerges from the mountain region, changes its course from N. W. to S., and sweeping around the W. extremity of the Himalaya range, crosses the N. W. part of Cashmere, and flows in a tortuous S. W. and S. direction through the Punjab and Sinde to the Arabian sea. At Derbend on the N. frontier of the Punjab its maximum width in ordinary seasons is 300 feet. It has 5 fords between Derbend and Attock, a distance of 60 m., but they are only available when the water is lowest, and the passage even then is dangerous. It is related that Runjeet Singh once lost 7,000 men in trying to cross at one of these fords with his army. Near Attock the Indus is joined by the Cabool, a large tributary which drains Cabool and the S. slopes of the Hindoo Koosh, and Chitral, and is navigable for 40 m. The breadth of the Indus is here 858 feet, its depth 60 feet, and the rapidity of the current 6 m. an hour. The fall from Attock to the sea is about one foot per mile, but in some places the descent is much greater. About 10 m. below Attock the river becomes a violent torrent, and it retains this character for nearly 100 m. It passes through the Salt mountains which connect the Sufeld Koh with the Himalaya, and rushes down a valley from 100 to 400 yards wide between precipices from 70 to 700 feet high. At Ghora Trup, 20 m. below Attock, its channel is 250 feet wide and 180 feet deep, and its velocity 10 m. an hour. At Kala Bagh it enters a plain and becomes a deep muddy stream, with low banks which are frequently overflowed, the inundation extending sometimes 20 m. westward and 10 or 12 m. eastward. In lat. $28^{\circ} 55' N.$, long. $70^{\circ} 28' E.$, it receives the river Punjnad, the great artery of the Punjab, its breadth being here 1,824 feet, while that of its tributary is 5,298 feet; but the latter has a less volume of water than the Indus. The united streams below here have a width at the driest seasons of 6,000 feet. A little above Roree the Indus sends off a branch called the Eastern Narra, which sometimes unites with the Koree, the easternmost deltoid branch of the parent stream, but is generally lost in the desert. At Roree there are 4 rocky islands, on one of which is the fort of Bukkur. Fifty m. lower down, the Western Narra separates from the Indus, rejoining it after a course of 120 m. The Fulaalee, a large but yearly diminishing branch, leaves it on the E. 12 m. above Hyderabad, and an offset from it reunites with the parent stream 15 m. below that town. Here the delta commences. The principal arms are the Koree, which is properly an arm of the sea, being salt, and having at a distance of 20 m. from its mouth a depth of 20 feet and a breadth of 7 miles; the Pinyaree; the Buggaur; the Sata, which is properly the continuation of the Indus; the Kookywarree, which was once the principal embouchure,

but is now choked up with sand; the Hujamree; and the Pitty, which is one of the largest and deepest of all. The sea coast of the delta is 180 m. long. The influence of the tide extends about 70 m., and spring tides rise 9 feet. The length of the Indus is 1,814 m., of which 943 (to Attock) are navigable without interruption. Rapids occur here, but above them the stream is again navigable almost to its sources. The native population on its banks are experienced boatmen, and many of them live altogether in boats. The vessels used in lower Sinde, called doondahs, are clumsy, flat-bottomed crafts, measuring from 30 to 50 tons. Further up the country a lighter boat of the same kind is used, and for navigating the rapid parts of the current there are strongly built, heavy vessels called duggahs. During the S. winds which last about half the year the upward navigation is performed by sail, but at other times recourse is had to tracking. The British have steamers from Kurrachee at the W. end of the delta to Mooltan on the Chenaub, one of the constituents of the Punjnad, and it is believed that if certain improvements were made in the channel the Indus would become a commercial highway of almost unrivalled importance. Gold is found in its upper course. It is infested with crocodiles of the long-snouted kind, and abounds in fish.

INDUSTRIAL SCHOOLS, a term used to designate 3 classes of educational institutions: 1. Scientific schools, such as the *école des arts et métiers* at Paris and Berlin, and the polytechnic schools of the same cities; the schools of metallurgy, manufacturing, mining, and the chemical arts, so numerous on the continent of Europe; schools of civil engineering, architecture, and agriculture. Their number is constantly increasing, but they have nowhere else attained so high a development or so thorough a course of instruction as in Prussia, Saxony, Bavaria, and the duchy of Nassau. It is owing to the chemical and mechanical skill, and the tact and taste in the arts of design, developed by these schools, that the continental nations of Europe have been able to maintain their supremacy in manufactures. The industrial school (*Gewerbschule*) at Chemnitz in Saxony, one of the best of its class, in 1857 had 16 professors and teachers, and 237 pupils. Some of these schools have very large corps of professors, and courses of study usually occupying 6 or 7 years. 2. Technical schools, in which, in connection generally with elementary instruction in the common branches of study, the pupils are taught some practical art, trade, or employment; such are the lace workers' schools in Belgium and Ireland, the free schools of the arts of design, the agricultural farm schools, the schools for teaching household duties to girls, sustained in part by the liberality of Miss Burdett Coutts, and the schools for industrial instruction established in New York by Peter Cooper in connection with his "Union." In France, Belgium, many of the German states, and Ireland, such schools are numerous. A great impulse has been given to

industrial instruction by the establishment of industrial associations in various countries, particularly in Germany, where they have become very numerous since 1848. 3. Schools established for the training of pauper and vagrant children in the habits of industry, and their instruction in rudimentary studies in connection with employment in some simple art or trade, by which they may subsequently obtain a partial support. These schools, to which the name industrial school is most generally applied, are wholly charitable; the children are usually wholly or partially clothed by the school, and one meal a day or sometimes two furnished them. The first idea of such a school seems to have originated with a poor mason in Rome, Giovanni Borgia (1736-1802), who collected the vagrant boys of that city in his own house, taught them to work, had them instructed in the rudiments of learning, and when they were old enough apprenticed them to artisans. John Pounds, a benevolent shoemaker of Edinburgh, followed in the same course of benevolence a few years later. Within the past 25 years the zeal for the reformatory training of juvenile delinquents has led to special efforts in behalf of vagrant, truant, and "dangerously exposed" children in Europe, and more recently in the United States. One of the earliest of these was the work-school (*Arbeitschule*) of Gustav Werner at Reutlingen, Würtemberg, established in 1837, and now containing more than 1,000 pupils. Werner himself is an educational missionary, who travels throughout Würtemberg and the adjacent states, and, gathering up the poor, homeless, vagrant boys, brings them to his school. The expenses connected with this school are very light, and are nearly defrayed by the labor of the children; the older boys often remain for several years to perfect themselves in their trades, and their earnings beyond food and clothing go into the common fund. Werner finds no difficulty in obtaining profitable employment for all his boys on leaving his establishment. In 1841, William Watson, sheriff substitute of Aberdeenshire, organized a system of industrial schools in Aberdeenshire, which embraces all classes of idle and vagrant children, and has had the effect of clearing a large town and county of juvenile criminals and beggars. His plan embraces gratuitous education, 3 substantial meals a day to the children, and 4 hours of useful labor, together with the prohibition of street begging, and the sending of all children found begging to the industrial school for food, instruction, and work. With this he connected a child's asylum for juvenile criminals, where they were educated and taught a trade. The success of Sheriff Watson's scheme led to the establishment of similar schools in Edinburgh, Glasgow, Dublin, Cork, London, Manchester, Liverpool, and Birmingham. The purpose of the agricultural reform school at Ruyssede, Belgium, the horticultural reform school at Petit Bourg, France, the rural school at Carra and the reform school at Bachtelen, both in Switzerland,

is the same, and all have met with a good degree of success. In this country the industrial school movement dates within the past decade. The incorporation of the juvenile asylum at New York in 1851 was one of the first attempts at providing for the class of vagrant and truant children; and though not now technically belonging to the class of industrial schools, it had its influence in leading to their organization. The children's aid society, the home for the friendless, the Five Points mission, and the Five Points house of industry, as well as several religious corporations, have aided in the organization of these schools, of which there are now 10 or 12 in New York city, and one or more in most of the larger cities of the country. The industrial occupation in these schools, in the United States, does little or nothing toward diminishing the cost of maintenance, while in Europe it is of material service in that direction. The cost per head was stated by Mr. Brace, the secretary of the children's aid society in New York, in 1857, as about \$5 per annum. On the continent of Europe industrial as well as secular instruction is given in the Sunday schools, while in the United States religious instruction only is given on that day, and hence the American ragged Sunday schools are not to be identified with industrial schools.

INES DE CASTRO. See CASTRO, INES DE. INFANT. All persons are called infants, by the common law of England and America, until the age of 21. The only exception within our knowledge, is that in Vermont and in Maryland women are of full age, for many purposes at least, at 18. An infant becomes an adult, or of full age, at the beginning of the last day of his 21st year, or the day before his 21st birthday. This rule is founded upon the ancient principle, that the law knows no parts of a day, and when the last day of infancy begins, it is considered as ending.—The most general principle in reference to the legal condition of an infant, is his inability to bind himself by his contract. An infant, using the word in its common meaning, as a child still in its mother's arms, is under an actual inability to contract, but soon acquires this ability, and at 18 or 20 is often as able as ever after. But the law asserts the inability of the infant for the sake of the infant, not as a restraint upon him, but as a protection to him, and finds that upon the average of mankind this protection should be extended until the age of 21. We must remember that this inability is intended for his protection only, and not as a means of harm to him, or a means by which he may do harm to others; or, in legal phrase, it is his shield, and he must not use it as his sword. Because it is for his benefit, the first and most important exception is, that he may bind himself by his contract for necessities; for it might harm and could not help the child, if he were unable to pledge his credit for shelter, clothes, or food. At first, the exception was confined to strict necessities; but it has been gradually extended,

until now it is frequently said to mean all those things which it is perfectly proper for the infant to have, taking into view his age, his means, and his condition or circumstances. Thus he may make a valid bargain for clothes, or even ornaments or furniture, as well as food and lodging, more expensive than another may need, but not extravagant or superfluous for him. In England it has been held that instruction in reading and writing is among these necessities for every one who could pay for it. In the United States it is held that the full benefit of a good school education is among these necessities; but as yet it seems doubtful whether a collegiate education is a necessary. We should say, however, that this also would be held a necessary, where it was certain that the young man could afford it; for even in England, as well as in some of our own courts, it has been said that a liberal education might be a necessary for some. So, as an infant may lawfully marry, necessities for his wife and children may be lawfully contracted for by him. The line is drawn so as to exclude quite distinctly all trade or business bargains; for the whole legal doctrine of infancy rests on the assumption of the infant's inability to carry on the business of manhood, until he has the maturity of at least 21 years. And it should be noticed, that all his contracts even for necessities are not, strictly speaking, valid. Thus, if he buy suitable food or clothing, and agree to pay a certain price therefor, or give his note therefor, he is not bound to pay that price or that note; but, if sued on the promise, he may defend so far as to show that the food and clothing were not worth so much as he promised to pay, and then he will be held only for their value. But he cannot avoid his obligation to pay their full value, merely because he promised to pay too much. Formerly the distinction was, that an infant's contracts, not for necessities, were entirely void, if the court saw that they could not be beneficial to him, but only voidable by him if this were doubtful. Now, however, the prevailing rule is, that all contracts of an infant not for necessities are voidable by him, but that none are void; because all may be made valid by his ratification after full age, which could not be the case if they were wholly void at their inception. Any acts or words on his part have the effect of this ratification, if they are made after majority, and amount to a distinct promise on his part to pay the debt; but a mere acknowledgment that when he was an infant he made such a promise, does not bind him when adult. It has been also held, that this promise must be made with a distinct knowledge that he is undertaking to pay a debt which he need not pay unless he chooses to. The mere fact that, after full age, he does not disaffirm his contract made in infancy, does not amount to a ratification; but it may be made to have this significance and effect by circumstances, and certainly has this effect if after majority he voluntarily continues for

any considerable time in use, possession, and ownership of property acquired by his contract made while an infant. A distinction is taken here between an infant's real estate and his personal estate; and it is said that he may ratify a contract for the latter with much less of formal and positive ratification than is necessary for the confirmation of his conveyances of real estate. Still, a silent acquiescence in the possession of his grantee, if long enough, and with full knowledge of his rights, may amount to ratification.—As the disability of an infant is only for his personal benefit, no one can take advantage of it but himself or his legal representatives. Therefore, if an adult makes a business contract with an infant, the adult is bound although the infant is not. Thus, an infant may sue an adult for a breach of a promise of marriage; but neither an adult nor an infant can sue an infant for such breach. So an infant may bring an action on a mercantile contract, although such an action cannot be brought against him.—It is sometimes important to determine whether an infant is bound by the obligations which attach to property that he acquires by his contract. If he takes the property by direct operation of law, as by descent or marriage, there is no question, for the rule *transit terra cum onere* would apply, and be extended even to property that was not land. But if he acquires the property by his own act, the law may not be so certain. Thus, an infant who takes a lease of land, and holds possession until rent is due, is bound to pay the rent, like any other person; but he may, when he will, disclaim the land and annul the lease, or rather suspend the lease; for it is said that when he is of age he may disclaim and avoid his disclaimer. So, if he buys stock in a corporation, he is liable like an adult for assessments and calls, but may waive his contract and give up his stock.—While an infant is protected against his contracts, he is not protected against his acts; that is, he is answerable in like manner as any other person for the injury he inflicts by his wrong doing, excepting so far as actual infancy or immaturity tends to make him irresponsible, or to excuse him, as an equal amount of actual incapacity would excuse any one. But, in the case of tort, as before in the case of contract, if he gives his promise or his note as a compensation for the wrongs he inflicts, he would be held not on his promise, but only to the extent of his original liability. The most interesting and the most difficult application of the rule, that an infant is liable for his wrong doings, occurs in relation to his frauds, in representing himself as of full age. Where his tort is merely the breach of his contract, he cannot be sued on the tort, for this would be holding him indirectly to his contract. But if there be a distinct wrong for which he is responsible, he is answerable, although it be connected with the contract; and this, whether it be before or after the contract. Thus, if he hire a horse for an unnecessary ride, he is not liable for the hire; but if in

the course of the ride he abuses and injures the horse, for this we should hold that he would be liable; and if he should sell the horse, an action for its value would lie, nor would his infancy be a bar. So if he falsely and fraudulently represents himself as of full age, and on the strength of these representations his note or bond is received in payment for a purchase, he cannot be held on the note or bond, nor as purchaser for the price of the goods; but he may be sued in the proper action for his fraud, and if he have previously refused to pay his note or bond or the price of the goods, their value would seem, by what we think the better though not perhaps the established rule of law, to be the measure of the damages which would be recovered against him. For this reason we should hold that infancy should not be a bar to an action founded upon a false and fraudulent warranty, although on this point the authorities are in conflict. So if goods are sold to an infant on his fraudulent representation that he is of age, we should say that the seller might consider the sale null and void, and reclaim his goods as soon as he discovers the fraud; but perhaps not until his refusal to pay, or some other indication of his intending injury. We do not think, however, that his mere silence, and his permitting the seller to act on the supposition that he was of full age, would have this effect. When goods are sold to an infant with no fraudulent representation on his part, and with a knowledge of his infancy on the part of the seller, and the infant subsequently refuses to pay for them, and avails himself of his infancy, as he certainly may, to refuse payment of the price, some doubt, or at least some conflict, exists as to the rights of the seller. Some authorities hold that the seller is remediless, because the privilege of the infant protects him altogether. We should say, however (and in this we have the support of other authorities), that this privilege goes no further than to permit him to cancel the sale if he will, for this is quite enough for his protection; and when the sale is cancelled, its effect is wholly destroyed, and the thing sold becomes again the property of the seller, who may repossess himself of it at his pleasure. It seems to be universally admitted, that if the infant has received the goods and paid for them, he may return the goods and recover the money, but cannot recover the money without returning the goods.—A very important part of the law of infancy, and that which perhaps gives rise to more disputes and litigation than any other, is that which determines the obligation of the parents in respect to infant children. Unfortunately, a part of this law is not quite settled. In some form or other, and in some degree, the obligation of a father to maintain his infant child is acknowledged by the law of all civilized communities. For the infant cannot support himself, and therefore some one must do it; and then the only question is, whether this obligation falls directly on the state, or on the father in the first place. Jus-

tice and reason and all the best feelings of human nature would seem to answer that it is primarily the duty of the parent. But in England, after some uncertainty, and with some reluctance, and perhaps some tendency to make this moral obligation of the father a legal one also, it seems now to be the prevailing and perhaps established rule, that there is no other foundation for the liability of the father for necessities supplied to the child, excepting the principle of agency; that is, the father is liable only when the child contracts for them, and may be deemed the agent of the father in making the contract. In a few of our states this doctrine has been very positively asserted, as in Illinois (3 Scammon, 180), and in Vermont (11 Vermont, 258, and 17, 350). But, in England, and in all of the United States which require the father's authority to be proved, this authority is inferred from very slight evidence. Perhaps no case goes so far as to say directly, that if a father sees or knows that goods are supplied to his infant child, and he does not signify his dissent, his assent and responsibility may be inferred; but some of them go, in fact, to almost this extent. But the question occurs: How would these courts decide where the case was one which made agency or authority impossible? As if an infant of a month old, or an older child reduced to utter incapacity by starvation or illness, were lost in a wood, and found by a person who supplied him with strict necessities; would he have no claim on the father? Perhaps the law on this subject cannot be said to be determined either in England or America; but as prevailing rules, in this country at least, derived from an investigation and comparison of the authorities, we should say: 1, where goods are supplied to an infant which are not necessities, the father is not answerable unless his authority can be proved in the common way; 2, where necessities are supplied, his authority will be presumed, unless he either supplied them himself, or was ready to supply them; 3, where an infant lives with the father or under his control, the father's judgment as to what the child should have will be so far respected, that he will be held liable only for those things which were strictly necessary to preserve the child from absolute want and suffering; 4, where the child has voluntarily left the father, and does not live with him, the father's authority must be strictly proved, unless in case of extreme youth, or perhaps of absolute necessity; 5, where the child has been cruelly driven away by the father, he carries with him the father's credit for necessities; 6, in all these rules, "necessaries" mean strict necessities; and if the child is able to earn or provide them in part, this must be taken into consideration. Where a child has an independent property of his own, courts now go, in general, very far in requiring this to be made the fund for his support, before the father is called upon. Whether the mother is under the same liability as the father may not, perhaps,

be certain; but we consider the decided weight of authority as qualifying the mother's liability importantly, even where its existence is admitted.—While the father is thus liable for the child, it is the universal rule that he is entitled to the custody of the child (unless for special reasons), and is also entitled to all the child's earnings; and some of our courts, very rationally, we think, connect this right and this obligation together, founding one on the other. It is certain that the father may agree with his minor child to relinquish his right to the child's earnings, and thereafter to have no responsibility for his support. Such agreements are common in the United States, and notice thereof is often given by public advertisement. Such a notice would certainly have much force in favor of a father against one who had knowledge of it; and if a stranger in ignorance of it employed a son, he might interpose it as a defence if the father demanded the son's wages. But if a stranger supplied a minor child, at a distance from home, with strict necessities, to save his life or health, even with knowledge of this bargain, we are not disposed to believe that it would bar his claim against the father. If a child be of full age, the obligation to support him is now so entirely gone, that even if a father, after necessities supplied to an adult child without his request, promises to pay for them, he cannot be held on this promise, because there is no legal consideration for it. It may be added, that if an infant, while under his father's care, and actually supported by him, makes a contract even for necessities, and gives his own promise to pay for them, the infant is not liable on this contract or promise, because, as it is said, this would interfere with the father's right to judge what is necessary for him. Perhaps a better reason is, that in such a case these things are not necessary in any proper sense of the word, for the very reason that the child derives a sufficient support from the care of the father.—A father is never liable for the wilful tort of an infant child; nor has he a right, merely as father, to bring an action in his own name for an injury to his child, unless in some way, as by the necessary expense or otherwise, he is himself injured. Neither can he give a valid release for an injury to his child. He may will away all his property, real or personal, from all his children, minor or adult, if he mentions them in the will in such a way as to show that he intends to do this. If he does not mention them thus, the law will in many states give to the child thus forgotten his legal share; but the statutory provisions on this subject in the different states are not uniform.

INFANT SCHOOLS. Pestalozzi was the first teacher of modern times who systematized infant instruction, and in the early part of the present century his system, improved and developed by later writers, reached its culminating point. Infant schools were established throughout Great Britain and the continent of Europe, and in every considerable

town in the United States. Men of the highest rank in the cause of education advocated with great earnestness their organization. It was found, however, after a few years' experience, that these schools were doing more injury than good. The tender brain of the infant was stimulated to preternatural activity; the memory and the other intellectual faculties were unduly excited at a time when the physical development was exhausting the nutritive powers; and the result was a diseased precocity, terminating in early death, imbecility, or such subsequent delay of development as to render the intellectual progress of the child slower than if instruction had been commenced later. The infant schools have therefore been very generally abandoned; a few still exist in Great Britain, and in Bavaria and some of the other German states, but even these do not now attempt to force the mental growth as they once did. Within a few years past an eminent German educator, Friedrich Froebel, has inaugurated a new method of infant training, which is producing better results, and which obviates the difficulties and evils of the Pestalozzian system. He gave it the name of the *Kindergarten* (child's garden). This consists of a series of large, well ventilated, well lighted, and pleasant rooms, opening upon a garden, in which, beside the playground for all, and a large garden plot, there are small plots for each child old enough to cultivate them. In the large garden are flowers, useful vegetables, and trees, and birds are encouraged to make it a home. The children may be from the age of 2 months to 14 years. They pass from 3 to 5 hours a day at the gardens. The infants are accompanied by their mothers or nurses, or, in default of this, are placed in charge of the teachers, young well educated women who enter into the work from a sincere love for it and for children. Froebel was very particular on this point of the selection of teachers, deeming it indispensable to the success of the institution. Not more than 25 children should be under the care of a single teacher, and the elder children are of great assistance in carrying out the system. They enter with ardor into the plays, counsel the little ones in their games and gardens, and the little children in turn delight to wait upon them in the care of birds and animals. No corporal punishment is allowed; exclusion from a game, or from the gardens for a day or more, is the only punishment found necessary. Froebel devised many games and exercises for his course of instruction, and, as a part of the necessary apparatus, prepared his 6 gifts, which are used in all the *Kindergärten*. It should be observed that in the use of all these gifts an explanatory song, sung at first by the teacher, and afterward by the children themselves, accompanies each exercise or game. The 1st gift consists of 6 soft balls of different colors, and a string. The colors are red, blue, and yellow—green, violet, and orange. They are moved horizontally, vertically, and in circles before the infant, by the teacher or an older

child, who sings the song explaining the motions. By these balls the child obtains ideas of form, color, size, and movement, as well as of his own individuality. The 2d gift is a cube, a cylinder, a wooden ball, a stick, and a string. These are rolled, whirled, dragged, and used in a great variety of ways, and from them the child acquires ideas of form, size, sound, movement, and of development according to a fixed law. The 3d gift is a cube cut into 8 equal cubes. These the child arranges into other forms, and receives new lessons in the law of development, gets a notion of angles, cubes, the laws of construction, and the division of units into halves, quarters, and eighths. He should always be taught to construct from the centre. The 4th gift is a cube divided into 8 equal planes. In the use of this the children unite around a table, and construct together their buildings and other objects. By means of this and the preceding gifts, the alphabet and the elementary principles of arithmetic and geometry may be taught. The 5th gift is an extension of the 3d; the cube is divided into 27 small cubes, and 3 of these are divided diagonally into halves and 3 into quarters. This introduces the triangle, and gives scope for the construction of the arch and other architectural objects, and for practical perspective. The 6th gift is an extension of the 4th, the cube being divided into 27 planes, of which 6 are again divided, 3 in height, and 3 in breadth. In the use of these the children are taught to build from the teacher's dictation. A 7th gift is added, containing all the forms of the last four. To these gifts are subsequently joined movable lines or plaiting sticks, which are also used for construction, being united when necessary by softened peas, pasteboard, and tissue paper, to be combined into figures and objects, and soft clay for modelling, in which many of the children became very expert. Drawing in the net, that is, on a slate furrowed into squares, and subsequently on paper ruled with a pale ink in squares, and painting in the net, are also introduced. The gymnastic exercises are still plays, of which there are a great variety, intended to develop all the muscles; these, too, are all accompanied by songs explanatory and instructive. For older pupils Froebel established scholars' gardens, in which workshops took the place of the games. During Froebel's life (he died in 1852) more than 50 *Kindergärten* were established in Germany, Belgium, and Switzerland, and the number is now largely increased; and there are several in London, Paris, Hamburg, and other European cities. The most advanced at present is at Dresden. The baroness Marenholtz has published a manual of the instruction at Brussels.

INFANTE (Lat. *infans*, infant), a title given in Spain and Portugal to the royal princes, the eldest of whom, the heir apparent to the crown, is alone called *el príncipe*, the prince. The feminine form of the word, *infanta*, is applied to the royal princesses. "An *infanta* of Spain" means a Spanish princess of the royal family.

The term *infante* was used at a very remote period. It occurs in documents of the 10th century.

INFANTRY, the foot soldiers of an army. Except among nomadic tribes, the great mass, if not the entire strength of all armies has always consisted of foot soldiers. Thus even with the first Asiatic armies, with the Assyrians, Babylonians, and Persians, infantry made up, numerically at least, the main body. With the Greeks at first the whole army was composed of infantry. What little we know of the composition, organization, and tactics of ancient Asiatic infantry, has already been stated in the article ARMY, to which we refer for many details which it would be useless to repeat here. In this article, we shall restrict ourselves to the most important tactical features only in the history of the arm; we therefore at once begin with the Greeks. I. GRECIAN INFANTRY. The creators of Grecian tactics were the Dorians; among them, the Spartans brought to perfection the ancient Doric order of battle. Originally, the whole of the classes which composed a Dorian community were subjected to military service; not only the full citizens who formed the aristocracy, but also the subject *periæci*, and even the slaves. They were all formed into the same phalanx, but each in a different position. The full citizens had to appear heavily armed, with defensive armor, with helmet, cuirass, and cuissarts of brass, with a large wooden shield covered with leather, high enough to protect the whole person, and with a lance and sword. They formed, according to their numbers, the first or first and second ranks of the phalanx. Behind them stood the subjects and slaves, so that every Spartan squire had his retainers in his rear; these were without the costly defensive armor, relying on the protection afforded to them by the front ranks and their shields; their offensive weapons were slings, javelins, knives, daggers, and clubs. Thus the Doric phalanx formed a deep line, the hoplites or heavy infantry in front, the *gymnetæ* or light infantry in the rear ranks. The hoplites had to bear down the enemy by the charge of their spears; once in the midst of the hostile body, they drew their short swords, and worked their way forward at close quarters, while the *gymnetæ*, who first prepared the charge by throwing stones and javelins over the heads of the front ranks, now assisted the onward pressure of the hoplites by disposing of the wounded and struggling enemies. The tactics of such a body were thus very simple; tactical manœuvring there was scarcely any; the courage, tenacity, bodily strength, and individual agility and skill of the men, especially the hoplites, decided every thing. This patriarchal union of all classes of the nation in the same phalanx disappeared soon after the Persian wars, principally from political causes; the consequence was that the phalanx was now formed exclusively of hoplites, and that the light infantry, where it continued to exist, or where a new light infantry was formed, fought separately as skirmishers. In

Sparta, the Spartan citizens along with the *periæci* formed the heavy armed phalanx; the helots now followed with the baggage, or as shield-bearers (*hypaspistæ*). For a while this phalanx was made to suffice for all the exigencies of battle; but soon the skirmishers of the Athenians, in the Peloponnesian war, compelled the Spartans to provide themselves with troops of a similar kind. They did not, however, form gymnetæ of their own, but sent out the younger portion of their men on skirmishing duty. When, toward the end of that war, the number of citizens and even of *periæci* had become greatly reduced, they were compelled to form phalanxes of heavily armed slaves, commanded by citizens. The Athenians, after banishing from the phalanx the gymnetæ, formed of the poorer citizens, of retainers and slaves, created special corps of light infantry, consisting of gymnetæ or *psiles*, destined for skirmishing, and armed exclusively for distant fighting, slingers (*sphendonetæ*), archers (*toxotæ*), and javelin-throwers (*akontistæ*), the latter also called *peltastæ* from the small shield (*pelta*) which they alone carried. This new class of light infantry, originally recruited from the poorer citizens of Athens, very soon came to be formed almost exclusively of mercenaries and the contingents of the allies of Athens. From the moment these skirmishers were introduced, the clumsy Doric phalanx was no longer fit to act alone in battle. Its materials, too, had been constantly deteriorating; in Sparta, by the gradual extinction of the warlike aristocracy; in the other towns, by the influence of commerce and wealth, which gradually undermined the ancient contempt of death. Thus, the phalanx, formed of a not very heroic militia, lost most of its old importance. It formed the background, the reserve of the line of battle, in front of which the skirmishers fought, or behind which they retired when pressed, but which scarcely ever was expected to come itself to close quarters with the enemy. Where the phalanx was formed of mercenaries, its character was not much better. Its clumsiness made it unfit for manœuvring, especially in ground but lightly broken, and its whole use was passive resistance. This led to two attempts at reform made by Iphicrates, a general of mercenaries. This Grecian *condottiere* exchanged the old, short spears of the hoplites (from 8 to 10 feet long) for considerably longer ones, so that, with closed ranks, the lances of 3 or 4 ranks projected in front and could act against the enemy; thus, the defensive element of the phalanx was considerably strengthened. On the other hand, to create a force fit for deciding battles by close yet rapid attack, he armed his *peltastæ* with light defensive armor and a good sword, and drilled them in the evolutions of the phalanx. When ordered to charge, they advanced at a pace unattainable by the phalanx of hoplites, gave a volley of javelins at 10 or 20 yards, and broke into the enemy with the sword. The simplicity of the ancient Doric phalanx had thus made way for

a far more complicated order of battle; the action of the general had become an important element of victory; tactical manœuvres had become possible. Epaminondas was the first to discover the great tactical principle which up to the present day decides almost all pitched battles: the unequal distribution of the troops on the line of front, in order to concentrate the main attack on one decisive point. Hitherto the battles of the Greeks had been delivered in parallel order; the strength of the front line was the same on all points; if one army was superior in numbers to the one opposed to it, either it formed a deeper order of battle, or it overlapped the other army on both wings. Epaminondas, on the contrary, destined one of his wings for attack and the other for defence; the attacking wing was composed of his best troops, and of the mass of his hoplites, formed in a deep column and followed by light infantry and by the cavalry. The other wing was of course considerably weaker, and was kept back, while the attacking one broke through the enemy, and the column, either deploying or wheeling into line, rolled them up with the assistance of the light troops and horsemen.—The progress established by Iphicrates and Epaminondas was still further developed when Macedonia had taken the lead of the Hellenic race and led them against Persia. The long lances of the hoplites appear still further lengthened in the Macedonian *sarissa*. The *peltastæ* of Iphicrates appear again in an improved form in Alexander's *hypaspistæ*. Finally, the economy of forces, as applied to the order of battle by Epaminondas, was extended by Alexander to a combination of the various arms such as Greece with her insignificant cavalry could never have produced. Alexander's infantry was composed of the phalanx of hoplites, which formed the defensive strength of the order of battle; of the light skirmishing infantry, which engaged the enemy all along the front, and also contributed to the following up of the victory; and of the *hypaspistæ*, to which belonged his own body guard, which, though lightly equipped, were still capable of regular phalangitic manœuvring, and formed that kind of average infantry which is more or less adapted to both close and extended order. Still, neither Greece nor Macedonia had produced a movable infantry which could be relied upon when opposed to a solid phalanx. Here, Alexander brought in his cavalry. The attacking wing was formed by the mass of his heavy cavalry, chosen from the Macedonian nobility, and with them acted the *hypaspistæ*; they followed the charge of the horsemen, and rushed into the gap they had made, securing the success obtained by them, and establishing themselves in the midst of the enemy's position. After the conquest of the centre of the Persian empire, Alexander used his hoplites chiefly for garrisoning the conquered towns. They soon disappeared from the army which subdued by its bold and rapid marches the tribes of Asia to the Indus and Jaxartes.

That army was formed chiefly of cavalry, hypaspistæ, and light infantry; the phalanx, which could not have followed on such marches, became at the same time superfluous from the nature of the enemy to be conquered. Under the successors of Alexander, his infantry, as well as his cavalry and tactics, were completely and rapidly deteriorated. The two wings of the order of battle were formed exclusively of cavalry, and the centre of infantry; but the latter was so little relied on, that it was covered by elephants. In Asia, the prevailing Asiatic element soon got the upper hand, and rendered the armies of the Seleucidæ all but worthless; in Europe, the Macedonian and Greek infantry regained some solidity, but with it came a return to the former exclusive phalangitic tactics. Light troops and cavalry never recovered, while much trouble and ingenuity were wasted in vain attempts to give to the phalanx that mobility which from its very nature it could never attain; until finally the Roman legion put an end to the whole system.—The tactical organization and manœuvres of the phalanx were simple enough. Being generally 16 deep (under Alexander), a line of 16 files formed a complete square, and this, the *syntagma*, formed the unit of evolutions; 16 syntagmas, or 256 files, formed a phalangarchy of 4,096 men, 4 of which again were to form the complete phalanx. The phalangarchy, in order of battle, formed in line 16 deep; it passed into the order of march by facing right or left, or by wheeling into syntagmas, in each case forming a close column 16 in front. When in line, the depth could be increased and front decreased by double files, the even files placing themselves behind the odd ones; and the opposite movement was performed by double ranks, reducing the depth from 16 to 8 men per file. Countermarching by files was employed when the enemy suddenly appeared in the rear of the phalanx; the inversion caused by this (every file being in a wrong place in its own section or syntagma) was sometimes set right by a countermarch by ranks in each section. Add to this the handling of the lance, and we have enumerated the various items of the drill of the ancient hoplites. It is a matter of course that the lighter troops, though not exactly destined to fight in close order, still were exercised in the phalangitic movements. II. ROMAN INFANTRY. The Latin word *legio* was originally used to express the totality of the men selected for field service, and thus was synonymous with army. Subsequently, when the extent of the Roman territory and the power of the enemies of the republic required larger armies, they were divided into several legions, each of which had a strength similar to that of the original Roman army. Up to the time of Marius, every legion was composed of both infantry and cavalry, the latter about $\frac{1}{10}$ of the former in strength. Originally the infantry of the Roman legion appears to have been organized similarly to the ancient Doric phalanx, fighting in a deep line, the patricians and richer citizens in heavy armor,

forming the front ranks, the poorer and lighter armed plebeians behind them. But about the time of the Samnite wars the legion began to undergo a change of organization, which soon placed it in perfect contrast to the Grecian phalanx, and of which, after it had attained its full development in the Punic wars, Polybius gives us a full account. The legion, of which 4 were generally levied for each campaign, was now composed of 4 classes of infantry, *velites*, *hastati*, *principes*, and *triarii*; the first, formed from recruits, were light infantry; the *triarii*, from veterans, were the reserve of the army; the other two classes, forming the main fighting body or infantry of the line, composed the remainder of the army, and differed in this, that the *principes* were selected from those men who, after the *triarii*, had seen most service. The *velites* wore leather caps, light round shields for defensive armor, and carried swords and a number of light javelins; the remaining 3 classes had brass helmets, leather body armor covered with brass plates, and brass cuissarts. The *hastati* and *principes*, beside a short sword, carried two *pila* or javelins, a light one and a very heavy one; this latter formed the specific arm of attack of the Roman infantry. It was of thick, heavy wood, with a long iron point, weighing in all at least 10 pounds, and with the point nearly 7 feet long. It could be thrown at very short distances only, say 8 or 12 yards, but from its weight its effect was formidable to the light defensive armor of those times. The *triarii*, beside the sword, carried lances instead of *pila*. Every legion contained 1,200 *hastati*, divided into 10 *manipuli* or companies of 120 men each; the same number of *principes*, similarly divided; 600 *triarii*, in 10 *manipuli* of 60 each; and 1,200 *velites*, 40 of whom were attached to each of the 30 *manipuli*, and formed the rear ranks unless otherwise employed. The *hastati* formed the first line, each *manipulus* being deployed in line, probably 6 deep, with an interval from the next *manipulus* equal to its front, which, as the room allotted for every man in a rank was 6 feet, extended about 120 feet, the whole line extending 2,400 feet. Behind them, in second line, were placed the 10 *manipuli* of the *principes*, covering the intervals of the *manipuli* of the first line, and behind the *principes* the *triarii*, each line at an appropriate distance from the one in front of it. The *velites* skirmished before the front and flanks. By doubling files, the order of both could be reduced to one half its original extent of front, or 1,200 feet. The whole of this order of battle was calculated for attack. Capable, by the smallness of the tactical units and by the great liberty thereby secured to all its movements, of fighting in almost any kind of ground, it was immensely superior to the Grecian phalanx, which required a level plain, and had been very soon reduced by its own clumsiness to a mere formation for defense. The legion advanced; at 8 or 12 yards the *hastati*, probably doubling their ranks for the occasion, threw their heavy *pila* into the

phalanx, whose lances could not yet reach the Romans, and, having thereby broken the closed order of the phalangites, rushed upon them sword in hand. If a single manipulus got into disorder, the effect was not transmitted to the neighboring companies; if the combat continued without immediate decision, the principes marched up into the intervals, threw their pila, and broke in upon the enemy with the sword, thus giving the hastati an opportunity of disentangling themselves and reforming behind the triarii. In an extreme case, these latter advanced, either to finally decide the victory or to secure an orderly retreat. The velites, in company with the cavalry, did outpost duty, engaged the enemy in the beginning of the battle by skirmishing, and followed up the pursuit. The light pilum of the hastati and principes appears to have been principally used in defensive positions, to create disorder in the ranks of an advancing enemy before he was close enough for the heavy pilum. Marches to the front were begun from either wing, the first manipulus of hastati in front, followed by the first respectively of principes and triarii, then the 3 second manipuli in the same order, and so forth; marches to a flank were made in 3 columns, each of the 3 classes of infantry forming a column; the baggage was on the side furthest from the enemy. If the latter appeared from the side where the triarii marched, the army halted, and faced toward the enemy, the principes and hastati passing through the intervals of the manipuli of the triarii and taking up their proper positions.—When, after the second Punic war, the continued wars and extended conquests of the Romans, combined with important social changes in Rome and Italy generally, rendered the universal liability to military service almost impracticable, the Roman armies began gradually to be composed of voluntary recruits from the poorer classes, thus forming soldiers by profession instead of the old militia in which all the citizens were included. The army hereby entirely changed its character; and, the elements from which it was composed becoming deteriorated, a new organization became more and more a necessity. Marius carried out this new organization. The Roman horse ceased to exist. What little cavalry remained was composed of barbarian mercenaries or allied contingents. The distinction of the 4 classes of infantry was done away with. The velites were replaced by allied contingents or barbarians, and the remainder of the legion formed of one and the same class of infantry of the line, armed like the hastati or principes, but without the light pilum. The manipulus was replaced, as a tactical unit, by the cohort, a body averaging 360 men, and formed originally by the fusion of 3 manipuli into one; so that the legion was now divided into 10 cohorts, which were generally disposed in 3 lines (1, 3, and 3 cohorts respectively). The cohort was formed 10 deep, with 3 to 4 feet front for each file, so that the total extent of front of the legion was very much reduced (about 1,000 feet). Thus, not only

were the tactical movements much simplified, but the influence of the commander of the legion was made much more immediate and powerful. The armament and equipment of every soldier was lightened, but on the other hand he was made to carry the greater part of his baggage on wooden forks invented for the purpose by Marius (*muli Mariani*); the *impedimenta* of the army were thus considerably reduced. On the other hand, the concentration of 3 manipuli into one cohort could not but reduce the facility of manœuvring in broken ground; the absence of the light pilum reduced the capability for defence; and the abolition of the velites, not always fully replaced by foreign auxiliaries or mercenaries, or by the *antesignani* (men selected from the legion for light infantry service by Cæsar, but left without arms for distant fighting), diminished the chances of maintaining an engagement and still evading a decision. Rapid, resolute attack became the only form of combat fitted for these legions. Still the Roman infantry continued to consist of Romans, or at least Italians; and in spite of the decline of the empire under the Cæsars, it maintained its ancient renown so long as the national character was left intact. But when Roman citizenship was no longer a necessary condition for admission into a legion, the army soon lost its standing. As early as the times of Trajan, barbarians, partly from the Roman provinces, partly from unconquered countries, formed the main force of the legions, and from that moment the character of the Roman infantry was lost. The heavy armor was thrown away; the pilum was replaced by the lance; the legion, organized into cohorts, was again fused into an unwieldy phalanx; and as a general unwillingness to come to close quarters was a characteristic of the infantry of this period, the bow and javelin were now used, not for skirmishing only, but also for the closed order of infantry of the line. III. THE INFANTRY OF THE MIDDLE AGES. The decline of the Roman infantry found a continuation in that of the Byzantine foot soldiers. A kind of forced levy was still maintained, but with no other result than to form the very dregs of the army. Barbarian auxiliaries and mercenaries composed its better portions, but even these were of no great value. The hierarchy and administrative organization of the troops was perfected to an almost ideal state of bureaucracy, but with the same result that we now see in Russia: a perfect organization of embezzlement and fraud at the expense of the state, with armies costing enormous sums and existing in part only on paper. The contact with the irregular horse of the East reduced both the importance and quality of the infantry more and more. Mounted archers became the favorite arm; the greater part if not all of the infantry were also equipped with the bow beside the lance and sword. Thus, fighting at a distance became the fashion, hand-to-hand encounters being regarded as out of date. The infantry was considered such rubbish that it

was intentionally kept away from the field of battle, and used for garrison duty principally; most of the battles of Belisarius were fought by the cavalry exclusively, and when the infantry partook in them, it was sure to run away. His tactics were entirely based upon the principle of avoiding a combat at close quarters, and of tiring out the enemy. If he succeeded in this against the Goths, who had no distance arms at all, by choosing broken ground in which their phalanx could not act, he was beaten by the Franks, whose infantry had something of the old Roman mode of fighting about them, and by the Persians, whose cavalry was certainly superior to his.—The German invaders of the Roman empire originally consisted for the greater part of infantry, and fought in a kind of Doric phalanx, the chiefs and wealthier men in the front ranks, the others behind them. Their arms were the sword and lance. The Franks, however, carried short, double-edged battle axes, which they threw, like the Roman pilum, into the hostile mass the moment before they charged sword in hand. They and the Saxons retained for some time a good and respected infantry; but gradually the Teutonic conquerors everywhere took to cavalry service, and left the duty of the foot soldiers to the conquered Roman provincials; thus the infantry service became despised as an attribute of slaves and serfs, and the character of the foot soldier necessarily sunk in proportion. By the end of the 10th century cavalry was the only arm which really decided battles all over Europe; infantry, though far more numerous in every army than cavalry, was nothing better than an ill-armed rabble with hardly any attempt at organization. A foot soldier was not even considered a soldier; the word *miles* became synonymous with horseman. The only chance for maintaining a respectable infantry lay with the towns, especially in Italy and Flanders. They had a militia of their own which was necessarily formed of infantry; and as its service for the protection of the towns, in the midst of the never-ending feuds among the surrounding nobles, was a permanent one, it was soon found convenient to have a force of paid mercenaries instead of a militia composed of the citizens, this latter force being reserved for extraordinary occasions. Still, we do not find that the contingents of the towns showed any marked superiority over the rabble of footmen collected by the nobles, and in battle always left to protect the baggage. This holds good, at least, for the classic period of chivalry. In the cavalry of these times, every knight appeared armed cap-à-pie, covered all over with armor, and mounting a similarly armed horse. He was accompanied by an esquire rather more lightly armed, and by sundry other mounted men without any armor and armed with bows. In order of battle, these forces were ranged upon a principle similar to that of the ancient Doric phalanx—the heavily armed knights in the first, the esquires in the second rank, the mounted

archers behind them. These last, from the nature of their arm, were soon employed in dismounted fighting, which became more and more the rule with them, so that their horses were mainly used for locomotion, not for a charge. The English archers, armed with the long-bow, while those of southern Europe carried the cross-bow, especially excelled in this mode of fighting on foot, and it was very likely this circumstance which soon led to an extension, in this service, of dismounted fighting. No doubt, in their long campaigns in France, the horses of the heavily armed knights got soon knocked up and unfit to serve for more than means of transport. In this plight it was natural that the worst mounted *gendarmes* should dismount and form a phalanx of lances, to be filled up by the better portion of the footmen (especially the Welsh); while those whose horses were still fit for a charge, now formed the actual fighting cavalry. Such an arrangement appeared very well adapted for defensive battles, and upon it were based all the battles of the Black Prince, and, as is well known, with perfect success. The new mode of fighting was soon adopted by the French and other nations, and may be considered as almost the normal system of the 14th and 15th centuries. Thus, after 1,700 years, we are brought back almost to the tactics of Alexander; with this difference only, that with Alexander cavalry was a newly introduced arm which had to strengthen the declining capabilities of the heavy infantry, while here the heavy infantry, formed by dismounted horsemen, was a living proof that cavalry was on the decline, and that a new day had dawned for infantry. IV. THE REVIVAL OF INFANTRY. From the Flemish towns, then, the first manufacturing district of the world, and from the Swiss mountains, arose the first troops which, after centuries of decline, again deserved the name of infantry. The French chivalry succumbed as much to the weavers and fullers, the goldsmiths and tanners of the Belgian cities, as the Burgundian and Austrian nobility to the peasants and cowherds of Switzerland. Good defensive positions and a light armament did the most, supported as they were in the case of the Flemish by numerous fire-arms, and in that of the Swiss by a country almost impracticable to the heavily armed knights of the time. The Swiss carried principally short halberds, which might be used as well for thrusting as for striking, and were not too long for hand-to-hand fight; subsequently they also had pikes, and cross-bows and fire-arms; but in one of their most celebrated battles, at Laupen (1339), they had no arms for distant fighting but stones. From defensive encounters in their inaccessible mountains, they soon came to offensive battles in the plain, and with these to more regular tactics. They fought in a deep phalanx; defensive armor was light, and in general confined to the front ranks and the flank files, the centre being filled up by men without armor; the Swiss phalanx, however, was always formed in

3 distinct bodies, an advanced guard, a main body, and a rear guard, so that greater mobility and the chance of varied tactical arrangements were secured. They soon became expert in taking advantage of the accidents of ground, which, coupled with the improvement in fire-arms, protected them against the onslaught of cavalry, while against infantry armed with long lances they devised various means to work an entrance somewhere through the forest of lances, after which their short heavy halberds gave them an immense advantage, even against men cased in armor. They very soon learned, especially when assisted by artillery and small fire-arms, to hold out in squares or cross-shaped bodies against the charges of cavalry; and as soon as an infantry was again capable of doing that, the days of chivalry were numbered. About the middle of the 15th century the struggle of the cities against the feudal nobility had been everywhere taken up by the princes of the larger monarchies now consolidating, and consequently the latter had begun to form armies of mercenaries both for putting down the nobles and for carrying out independent objects of foreign policy. Beside the Swiss, the Germans, and soon after them most other European nations, began to furnish large contingents of mercenaries, raised by voluntary enlistment, and selling their services to the highest bidder without any regard to nationality. These bands formed themselves tactically upon the same principle as the Swiss; they were armed chiefly with pikes, and fought in large square battalions, as many men deep as there were in the front rank. They had to fight, however, under different circumstances from the Swiss who defended their mountains; they had to attack as well as to hold out in defensive positions; they had to encounter the enemy in the plains of Italy and France as well as in the hills; and they very soon found themselves face to face with the now rapidly improving small arms. These circumstances caused some deviations from the old Swiss tactics, which were different according to the different nationalities; but the chief characteristics, the formation in 3 deep columns, figuring in name, if not always in reality, as advanced guard, main body, and rear guard or reserve, remained common to all. The Swiss retained their superiority until the battle of Pavia, after which the German *Landsknechte*, who had already for some time been nearly if not fully equal to them, were considered the first infantry of Europe. The French, whose infantry had as yet never been good for any thing, tried very hard during this period to form a serviceable national body of foot soldiers; but they succeeded with the natives of two provinces only, the Picards and the Gascons. The Italian infantry of this period never counted for any thing. The Spaniards, however, among whom Gonsalvo de Cordova during the wars with the Moors of Granada first introduced the Swiss tactics and armament, very soon rose to considerable reputation, and after the middle of the 16th century began to

pass for the best infantry of Europe. While the Italians, and after them the French and Germans, extended the length of the pike from 10 to 18 feet, they retained shorter and more handy lances, and their agility made them very formidable with sword and dagger in close encounter. This reputation they upheld in western Europe—France, Italy, and the Netherlands at least—to the close of the 17th century.—The contempt of the Swiss for defensive armor, based upon traditions of a different time, was not shared by the pikemen of the 16th century. As soon as a European infantry was formed in which the different armies were becoming more and more equal to each other in military qualities, the system of lining the phalanx with a few men covered with breastplates and helmets proved to be insufficient. If the Swiss had found such a phalanx impenetrable, this was no longer the case when it was met by another phalanx quite its equal. Here a certain amount of defensive armor became of some importance; so long as it did not too much impede the mobility of the troops, it was a decided advantage. The Spaniards, moreover, had never participated in this contempt for breastplates, and they began to be respected. Accordingly, breastplates, helmets, cuissarts, brassarts, and gauntlets began again to form a part of the regular equipment of every pikeman. To it was added a sword, shorter with the Germans, longer with the Swiss, and now and then a dagger. V. THE INFANTRY OF THE 16TH AND 17TH CENTURIES. The long-bow had for some time disappeared from the continent of Europe, excepting Turkey; the cross-bow made its last appearance among the French Gascons in the first quarter of the 16th century. It was everywhere replaced by the matchlock musket, which, in different degrees of perfection, or rather imperfection, now became the second arm of the infantry. The matchlocks of the 17th century, unwieldy and defectively constructed machines, were of very heavy caliber, to secure, beside range, at least some precision, and the force to penetrate the breastplate of a pikeman. The form generally adopted about 1530 was the heavy musket fired off from a fork, as a man could not have taken aim without such a support. The musketeers carried a sword, but no defensive armor, and were used either for skirmishing or in a kind of open order, to hold defensive positions or to prepare the charge of the pikemen for the attack of such positions. They soon became very numerous in proportion to the pikemen; in the battles of Francis I. in Italy they were far inferior to the pikemen in numbers, but were at least in equal numbers with them 30 years later. This increase in the number of musketeers compelled the invention of some tactical method of regularly encasing them in the order of battle. This was done in the system of tactics called the Hungarian ordinance, invented by the imperial troops in their wars with the Turks in Hungary. The musketeers, being unable to defend themselves at close quarters, were always

placed so as to be able to retire behind the pikemen. Thus they were sometimes placed on either wing, sometimes on the 4 corners of the wings; very often the whole square or column of pikemen was surrounded by a rank of musketeers, who found protection under the pikes of their rear men. Finally, the plan of having the musketeers on the flanks of the pikemen got the upper hand in the new tactical system introduced by the Dutch in their war of independence. This system is distinguished especially by the subdivision of the 3 great phalanxes in which every army was formed according to both the Swiss and Hungarian tactics. Each of them was formed upon 3 lines, the middle one of which was again subdivided into a right and a left wing, separated from each other by a distance equal at least to the extent of front of the first line. The whole army being organized in half regiments, which we will call battalions, each battalion had its pikemen in the centre and its musketeers on the flanks. The advanced guard of an army, consisting of 3 regiments, would thus be formed as follows: two half regiments in contiguous line in the first line; behind each of their wings another half regiment; further to the rear, and covering the first line, the remaining two half regiments also in contiguous line. The main body and rear guard might be placed either on the flank or behind the advanced guard, but would be formed on the same plan. Here we have a return in a certain degree to the old Roman formation in 3 lines and distinct small bodies. The imperialists, and with them the Spaniards, had found the necessity of dividing their large armies into more than the 3 masses already mentioned; but their battalions or tactical units were much larger than the Dutch, fought in column or square instead of in line, and had not had a regular formation for order of battle until during the Dutch war of independence the Spaniards began to form them in what is known as a Spanish brigade. Four of these large battalions, each consisting often of several regiments, formed in square, surrounded with a rank or two of musketeers, and having wings of musketeers at the corners, were disposed at proper intervals on the 4 corners of a square, one corner being turned toward the enemy. If the army was too large to be comprised in one brigade, two could be formed; and thus arose 3 lines, having 2 battalions in the first, 4 (sometimes only 3) in the second, and 2 in the third. As in the Dutch system, we find here the attempt to return to the old Roman system of 3 lines.—Another great change took place during the 16th century; the heavy cavalry of the knights was broken up and replaced by a mercenary cavalry, armed similarly to our modern cuirassiers, with cuirass, helmet, sword, and pistols. This cavalry, greatly superior in mobility to their predecessors, became thereby more formidable to infantry also; still the pikemen of the time were never afraid of it. By this change cavalry became a uniform arm, and entered in a far larger proportion into the com-

position of armies, especially during the period we now have to consider, viz., the 30 years' war. At this time the system of mercenary service was universal in Europe; a class of men had been formed who lived upon war and by war; and though tactics might have gained thereby, the character of the men, the material composing armies as well as their *morale*, had certainly suffered. Central Europe was overrun by *condottieri* of all kinds, who took religious and political quarrels for their pretext to plunder and devastate the whole country. The character of the individual soldier had entered upon that degradation which went on increasing until the French revolution finally swept away this system of mercenary service. The imperialists formed their battles upon the Spanish brigade system, having 4 or more brigades in line, thus forming 3 lines. The Swedes under Gustavus Adolphus formed in Swedish brigades, each consisting of 3 battalions, one in front and two a little to the rear, each deployed in line, and having the pikes in the centre and the musketeers on the wings. They were so disposed (both arms being represented in equal numbers) that by forming a contiguous line either could cover the other. Supposing the order given to form a contiguous line of musketeers, the two wings of that arm of the centre or front battalion would cover their own pikes by stepping before them, while those of the two other battalions would, each on its flank, advance into alignment with the first. If an attack of cavalry was apprehended, all the musketeers retired behind the pikemen, while the two wings of these latter advanced into alignment with the centre, and thus formed a contiguous line of pikes. The order of battle was formed of two lines of such brigades, composing the centre of the army, while the numerous cavalry was stationed on the two wings, and intermixed with small bodies of musketeers. The characteristic of this Swedish system is that the pikemen, who in the 16th century had been the great offensive arm, had now lost all capacity of attack. They had become a mere means of defence, and their office was to screen the musketeers from a charge of cavalry; it was this latter arm again which had to do all the attacking work. Thus, infantry had lost, cavalry had regained ground. But then Gustavus Adolphus put an end to the firing which had become a favorite mode of fighting for cavalry, and ordered his horse always to charge at full speed and sword in hand; and from that time to the resumption of fighting in broken ground every cavalry which adhered to these tactics was able to boast of great successes over infantry. There can be no greater condemnation of the mercenary infantry of the 17th and 18th centuries than that; and yet it was, for all purposes of battle, the most disciplined infantry of all times. The general result of the 30 years' war upon European tactics was that both the Swedish and the Spanish brigades disappeared, and armies were now disposed in two lines, the cavalry forming the wings and the infantry

the centre. The artillery was placed before the front or in the intervals of the other arms. Sometimes a reserve of cavalry, or of cavalry and infantry, was retained. The infantry was deployed in line, 6 deep; the muskets were so much lightened that the fork could be dispensed with, and cartridges and cartridge boxes had been everywhere adopted. The mixing up of musketeers and pikemen in the same infantry battalions now gave rise to the most complicated tactical movements, all founded upon the necessity of forming what was called defensive battalions, or what we should call squares against cavalry. Even in a simple square, it was no trifle to get the 6 ranks of pikemen from the centre so drawn asunder that they completely surrounded on all sides the musketeers, who, of course, were defenceless against cavalry; but what must it have been to form in a similar way the battalion into a cross, an octagon, or other fanciful shapes! Thus it happened that the drilling system of this period was the most complicated ever seen, and nobody but a soldier for life ever had any chance of attaining even the commonest proficiency in it. At the same time, it is obvious that, before the enemy, all these attempts at forming a body capable of resisting cavalry were perfectly useless; any decent cavalry would have been in the midst of such a battalion before one fourth of the movements could have been gone through.— During the latter half of the 17th century, the number of pikemen was very much reduced in proportion to that of musketeers; for from the moment that they had lost all power of attack, the musketeers were the really active part of the infantry. Moreover, it was found that the Turkish cavalry, the most formidable of the time, very often broke into the squares of pikemen, while they were quite as often repulsed by the well aimed fire of a line of musketeers. In consequence, the imperialists did away with all pikes in their Hungarian army, and replaced them sometimes by *chevaux de frise*, which were put together on the field, the musketeers carrying the blades as part of their regular equipment. In other countries, too, cases occurred of armies being sent into the field without a single pikeman, the musketeers trusting to their fire and the assistance of their own cavalry when threatened with a charge of horse. Still, two inventions were required to do away entirely with the pike: the bayonet, invented in France about 1640, and improved in 1699 so far as to be the handy weapon now in use; and the flint lock, invented about 1670. The former, though certainly an imperfect substitute for the pike, enabled the musketeer to give himself, to a certain degree, that protection which he had hitherto been supposed to find in the pikemen; the second, by simplifying the process of loading, enabled him to do much more than make up by rapid firing for the imperfections of the bayonet. VI. THE INFANTRY OF THE 18TH CENTURY. With the superseding of the pike, all defensive armor disappeared from infantry equipment,

and this arm was now composed of one class of soldiers only, armed with the flint-lock musket and bayonet. This change was accomplished in the first years of the Spanish war of succession, coinciding with the first years of the 18th century. At the same time, we now find everywhere standing armies of considerable magnitude, recruited as much as possible by voluntary enlistment coupled with kidnapping, but in case of need also by forced conscription. These armies were now regularly organized in battalions of from 500 to 700 men, as tactical units, subdivided for special purposes into companies; several battalions forming a regiment. Thus the organization of infantry now began to take a more stable and settled form. The handling of the flint lock requiring far less space than that of the old matchlock, the old open order was done away with, and the files were closed well up to each other, in order to have as many firing men as possible in the same space. For the same reason, the intervals between the various battalions in line of battle were reduced to a minimum, so that the whole front formed one stiff and uninterrupted line, the infantry, in two lines, in the centre, the cavalry on the wings. Firing, formerly done by ranks, every rank after having fired retiring to the rear to reload, was now done by platoons or companies, the 3 front ranks of each platoon firing simultaneously as the word of command was given. Thus an uninterrupted fire could be maintained by every battalion against the enemy in front of it. Every battalion had its distinct place in this long line, and the order giving to each its place was called the order of battle. The great difficulty now was to organize the marching order of the army so that it could always with facility pass from the marching to the fighting order, every portion of the line getting at once and quickly into its proper place. Encampments within reach of the enemy were arranged with a view to the same object. Thus the art of marching and encamping armies made great progress during this epoch; still the stiffness and unwieldiness of the order of battle formed a heavy clog upon all the movements of an army. At the same time, its formality, and the impossibility of handling such a line in any but the most level plains, still more restricted the choice of ground for battle fields; but as long as both parties were bound by the same fetters, this was no disadvantage for either. From Malplaquet to the outbreak of the French revolution, a road, a village, or a farm yard was tabooed to infantry; even a ditch or a hedge was considered almost a drawback by those who had to defend them. The Prussian infantry is the classic infantry of the 18th century. It was principally formed by Prince Leopold of Dessau. During the war of the Spanish succession, the line of infantry had been reduced from 6 deep to 4 deep. Leopold did away with the 4th rank, and formed the Prussians 3 deep. He also introduced the iron ramrod, which enabled his troops to load and fire 5 times in a minute, while other troops

scarcely fired 3 times. At the same time they were drilled to fire while advancing, but as they had to stop for firing, and as the alignment of the whole long line had to be maintained, the step was but slow—what is called the goose step. Firing began at 200 yards from the enemy; the line advanced at the goose step, stepping shorter and redoubling fire the nearer it got to the enemy, until the latter either gave way, or was so far shaken that a cavalry charge from the wings, and an advance with the bayonet of the infantry, drove him from his position. The army was always ranged on two lines, but, there being scarcely any intervals in the first line, it became very difficult for the second to come to the aid of the first when wanted. Such was the army and such were the tactics which Frederic II. of Prussia found at his disposal on his accession. There appeared to be very little chance for a man of genius to improve upon this system, unless he broke through it, and that Frederic, in his position and with the material he had for soldiers, could not do. Still he contrived to organize his mode of attack and his army so that he could, with the resources of a kingdom less than Sardinia now is, and with scanty pecuniary support from England, carry on a war against almost all Europe. The mystery may be easily explained. Hitherto the battles of the 18th century had been parallel battles, both armies being deployed on lines parallel to each other, struggling in a plain, fair, stand-up fight, without any stratagems or devices of art; the only advantage accruing to the stronger party being that his wings overlapped those of his opponent. Frederic applied to the line order of battle the system of oblique attack invented by Epaminondas. He chose one wing of the enemy for the first attack, and brought against this one of his wings, overlapping that of the enemy, and part of his centre, at the same time keeping back the rest of his army. Thus not only had he the advantage of outflanking the enemy, but also of crushing by superior forces the troops exposed to his attack. The other troops of the enemy could not come to the assistance of those attacked; for not only were they tied to their places in the line, but as the attack on the one wing proved successful, the remainder of the army entered into line and engaged the hostile centre in front, while the original attacking wing fell upon its flank after disposing of the wing. This was indeed the only imaginable method by which it was possible, while maintaining the system of lines, to bring a superior force upon any one part of the enemy's line of battle. Every thing, then, depended upon the formation of the attacking wing; and as far as the rigidity of the order of battle admitted of it, Frederic always strengthened it. He very often placed in front of the first line of infantry of the attacking wing an advanced line formed of his grenadiers or élite troops, so as to insure success as much as possible at the first onset. The second means which Frederic took to im-

prove his army was the reorganization of his cavalry. The teachings of Gustavus Adolphus had been forgotten; cavalry, instead of relying on the sword and the impetuosity of the charge, with rare exceptions had returned to fighting with the pistol and the carbine. The wars in the beginning of the 18th century had thus not been rich in successful charges of horsemen; the Prussian cavalry was especially neglected. But Frederic returned to the old plan of charging sword in hand and at full gallop, and formed a cavalry unequalled in history; and to this cavalry he owed a very great part of his successes. When his army became the model of Europe, Frederic, in order to blind the military men of other nations, began to complicate to an astonishing degree the system of tactical evolutions, all of them unfit for actual war, and intended only to hide the simplicity of the means which had procured him victory. He succeeded so well in this that nobody was more blinded than his own subordinates, who actually believed that these complex methods of forming line were the real essence of his tactics; and thus Frederic, beside laying the foundation for that pedantry and martinism which have since distinguished the Prussians, actually prepared them for the unparalleled disgrace of Jena and Auerstädt.—Beside the infantry of the line, which we have so far described, and which always fought in closed ranks, there was a certain class of light infantry, but this did not appear in great battles. Its task was the war of partisans; for this the Austrian Croats were admirably adapted, while for every other purpose they were useless. Upon the model of these half savages from the military frontier against Turkey, the other European states formed their light infantry. But skirmishing in great battles, such as was practised by the light infantry of antiquity and of the middle ages, even up to the 17th century, had completely disappeared. The Prussians alone, and after them the Austrians, formed a battalion or two of riflemen, composed of gamekeepers and forest guards, all dead shots, who in battle were distributed over the whole front and fired at officers; but they were so few that they scarcely counted. The resuscitation of skirmishing is the product of the American war of independence. While the soldiers of European armies, held together by compulsion and severe treatment, could not be trusted to fight in extended order, in America they had to contend with a population which, untrained to the regular drill of line soldiers, were good shots and well acquainted with the rifle. The nature of the ground favored them; instead of attempting manœuvres of which at first they were incapable, they unconsciously fell into skirmishing. Thus, the engagement of Lexington and Concord marks an epoch in the history of infantry. VII. THE INFANTRY OF THE FRENCH REVOLUTION AND OF THE 19TH CENTURY. When the European coalition invaded revolutionary France, the French were in a similar position to that of the Americans a short time

before, except that they had not the same advantages of ground. In order to fight the numerous armies, invading or threatening to invade the country, upon the old line principle, they would have required well drilled men, and these were scarce, while undrilled volunteers were plentiful. As far as time allowed, they were exercised in the elementary evolutions of linear tactics; but as soon as they got under fire, the battalions deployed in line dissolved themselves, unconsciously, into thick swarms of skirmishers, seeking protection against fire from all accidents of ground, while the second line formed a kind of reserve which often enough was involved in the fight from the very beginning of the engagement. The French armies, moreover, were very differently organized from those opposed to them. They were formed, not into an unending monotonous line of battalions, but into army divisions, each of which was composed of artillery, cavalry, and infantry. The great fact was all at once rediscovered that it matters not whether a battalion fights in its "correct" place in the order of battle, so that it advances into line when ordered, and fights well. The French government being poor, tents and the immense baggage of the 18th century were done away with; bivouacking was invented, and the comforts of the officers, which in other armies formed a large portion of the impediments, were reduced to what they could carry on their backs. The army, instead of being fed from magazines, had to depend upon requisitions on the country passed through. Thus the French attained a mobility and a facility of forming order of battle quite unknown to their enemies. If beaten, they were out of the reach of pursuit in a few hours; if advancing, they could appear on unexpected points, on the flanks of the enemy, before he got notice. This mobility, and the jealousy among themselves of the chiefs of the coalition, gave them breathing time to drill their volunteers, and to elaborate the new tactical system which was rising among them. From the year 1795 we find this new system taking the definite form of a combination of skirmishers and close columns. The formation in line was subsequently added, though not for a whole army as hitherto, but for single battalions only, which deployed in line whenever an opportunity appeared to require it. It is evident that this latter manœuvre, requiring more steadiness of drill, was the last to be resumed by the irregular bands of the French revolution. Three battalions formed a demi-brigade, 6 a brigade; 2 or 3 brigades of infantry a division, to which were added 2 batteries of artillery and some cavalry; several such divisions formed an army. Whenever a division met the enemy, the skirmishers of its advanced guard established themselves in a defensive position, the advanced guard forming their reserve until the division came up. The brigades then formed upon two lines and a reserve, but every battalion in column, and with no stated intervals; for the protection of rents in the

order of battle there was the cavalry and the reserve. The line of battle was no longer necessarily a straight and uninterrupted one; it might be bent in all directions, as the ground required, for now there was no longer a selection of naked level plains for battle fields; on the contrary, the French preferred broken ground, and their skirmishers, forming a chain in front of the whole line of battle, threw themselves into every village, farm yard, or copse that they could get hold of. If the battalions of the first line deployed, they generally all turned soon into skirmishers; those of the second line always remained in column, and generally charged in this formation against the thin lines of the enemy with great success. Thus, the tactical formation of a French army for battle gradually came to consist of two lines, each formed of battalions in close column, placed *en échiquier*, with skirmishers before the front, and a compact reserve in the rear. It was at this stage of development that Napoleon found the tactics of the French revolution. As soon as his accession to political power allowed him to do so, he began to develop the system still further. He concentrated his army in the camp of Boulogne, and there gave them a regular course of drill. He especially practised them in the formation of compact reserve masses on a small space of ground, and in the quick deployment of these masses for entering into line. He formed 2 or 3 divisions into one army corps so as to simplify the command. He invented and brought to its highest perfection the new marching order, which consists in spreading the troops over so great an extent of ground that they can subsist on the stores it contains, still keeping so well together that they can be united on any given point before the part which is attacked can be crushed by the enemy. From the campaign of 1809, Napoleon began to invent new tactical formations, such as deep columns of entire brigades and divisions, which however signally failed and were never again revived. After 1813 this new French system became the common property of all nations on the continent of Europe. The old line system, and the system of recruiting mercenaries, had both been abandoned. Everywhere the liability of every citizen to military service was acknowledged, and everywhere the new tactics were introduced. In Prussia and Switzerland every one had actually to serve; in the other states a conscription was introduced, the young men drawing lots to determine who should serve; everywhere reserve systems were introduced, by dismissing a portion of the men, when drilled, to their homes, so as to have a large number of drilled men at disposal in case of war, with little expense in peace.—Since that time several changes have occurred in the armament and organization of infantry, produced partly by the progress of the manufacture of small arms, partly by the collision of French infantry with the Arabs of Algeria. The Germans, always fond of the

rifle, had increased their battalions of light riflemen; the French, driven by the necessity of having in Algeria an arm of greater range, at last in 1840 formed a battalion of riflemen armed with an improved rifle of great precision and range. These men, drilled to perform all their evolutions and even long marches in a kind of trot (*pas gymnastique*), soon proved themselves of such efficiency that new battalions were formed. In this manner a new light infantry was created, not from sporting shots and gamekeepers, but from the strongest and most agile men; precision of fire and long range were combined with agility and endurance, and a force was formed which, as far as it went, was certainly superior to any other infantry in existence. At the same time, the *pas gymnastique* was introduced into the infantry of the line, and what even Napoleon would have considered the height of folly, running, is now practised in every army as an essential part of infantry drill. The success of the new rifle of the French riflemen (Delvigne-Pontchara) soon produced new improvements. The conical bullet was introduced for rifled arms. New means were invented by Minié, Lorenz, and Wilkinson, to make the bullet glide down easily into the bore, and still to expand it, when once down, so as to fill up the grooves with its lead, and thus to give it the lateral rotation and force on which the effect of the rifle depends; on the other hand, Dreyse invented the needle gun, to be loaded at the breech, and not requiring a separate priming. All these rifles were capable of hitting at 1,000 yards, and quite as easily loaded as a common smooth-bore musket. Then the idea arose of arming the whole of the infantry with such rifles. England was the first to carry out this idea; Prussia, which had prepared for this step long before, followed; then Austria and the smaller German states; at last France, Russia, and the Italian and Scandinavian states, are still behind. This new armament has completely changed the aspect of warfare, but not in the way expected by tactical theorists, and for a very simple mathematical reason. It can be easily proved, by constructing the flight of these bullets, that an error of 20 or 30 yards in the estimation of the distance of the object will destroy all chance of hitting beyond 800 or 350 yards. Now, while on the practice ground the distances are known, on the battle field they are not, and they change every moment. Infantry posted in a defensive position, and having had time to pace off the distances of the most conspicuous objects before the front, will thus have an immense advantage, at from 1,000 to 300 yards, over an attacking force. This can only be obviated by advancing rapidly and without firing, at full trot, to some 300 yards, when the fire of the two parties will be equally effective. At this distance firing will become so murderous between two well posted lines of skirmishers, and so many bullets will hit the pickets and reserves, that a plucky infantry can do no better than seize the first opportunity to make a

rush at the enemy, giving a volley at 40 or 50 yards. These rules, first proved theoretically by the Prussian Major Trotha, have been practically tried by the French in their late war against the Austrians, and with success. They will, therefore, form part and parcel of modern infantry tactics, especially if they prove to be of equally good effect when tried against such a rapidly loading arm as the Prussian needle gun. The arming of all infantry with one and the same rifle gun will tend to do away with the distinctions, still existing, of light and line infantry, by forming an infantry capable of any service. In this will evidently consist the next improvement of this arm.

INFINITESIMAL, in mathematics, a term applied to a quantity too small to be taken into account. In ordinary commercial transactions the mill is infinitesimal, cents alone being taken into account. Thus the size of the infinitesimal varies according to the nature of the problem. A quantity infinitesimal with respect to another infinitesimal is an infinitesimal of the 2d order, &c. Thus in treating of the mass of the earth, mountains might be considered infinitesimal, and hills infinitesimal of the 2d order, pebbles infinitesimal of the 3d order, and particles of dust infinitesimal of the 4th order. In geometrical demonstrations the infinitesimal must be assumed as smaller than any conceivable or expressible quantity. The correlative term to infinitesimal is infinite. The infinite in mathematics is therefore not invariably beyond the power of measurement, absolutely boundless, but only beyond the need of measurement. Only an infinite of an infinitely high order would be absolutely boundless; the last term of an endless series in which each term is infinitely greater than the preceding.

INFLUENZA (Ital., influence), EPIDEMIC CATARRH, or GRIPPE, an epidemic disease, usually taking the character of catarrh, attended with cough, fever of a nervous type, pains, and considerable debility and depression. Some authorities fix the earliest recorded occurrence of this epidemic in the year 1239, others as far back as 1174; and these enumerate 51 recurrences of it from that date to 1843, inclusive. The general uniformity of its character leaves little doubt that it has appeared at irregular intervals, as now, from a very early age. The epidemic of 1387 affected $\frac{1}{10}$ of the population through all Europe, and was very fatal. So early as 1557, the Spanish physicians recorded the inutilty, and often positive injury, in this malady, of blood-letting and active purgation. The epidemic of 1729-'30, following severe and changeable weather, traversed the whole of Europe from early summer into the following winter, leaving an unusual prevalence of chronic bronchitis and consumption.—In the simple or uncomplicated form, influenza usually begins with the premonitory symptoms of fever and catarrh, such as a feeling of lassitude, prostration, chilliness, rigors, headache, sneezing, and tenderness of the eyes; followed by copious dis-

charge of thin mucus from the nostrils, sore throat, hoarseness, fever, with sleeplessness, cough, hurried respiration, and sometimes difficulty of breathing. Nervous disorders and debility are very prominent. Among the former are pains in the head, back, or limbs, often severe, in the forehead, and especially over the eyes, or in the back of the neck or cheeks, and of a rheumatic character; sometimes giddiness, disordered senses, and delirium, or depression of spirits. Other symptoms are, a white fur upon the tongue; usually constipation; often nausea and vomiting; surface more moist than in ordinary fevers; pulse quick, but weak, or very variable at different hours of the day; cough often severe and obstinate, sometimes running into the convulsive form, though the chest may yield few or no morbid sounds, either upon percussion or auscultation. The blood, when drawn, is seldom buffed, and when it is so the clot has a jelly-like appearance, and does not contract, thus showing the absence of severe inflammation. A portion of the cases are always very light, little more than irritation or mild catarrh. The fever usually declines in from 3 to 5 days, attended with more free sweating or discharge from the lungs, and deposit of sediment by the urine; less acute symptoms last from 5 to 15 days longer. If complications be present, the course and duration are very uncertain; and in all cases the cough and debility may long persist, without obvious cause. The attack may take the form of fever with cerebral symptoms; of colic, diarrhoea, or dysentery, inflammation of the lungs, pleura, or pericardium. As complications, may be named an erysipelatous inflammation of the throat; disorders of the stomach; bronchitis, with marked difficulty of breathing; pneumonia, of a low or asthenic character, with great oppression of the chest; pulmonary consumption, aggravated by, but seldom fatal in, the attack; spitting of blood; pleurisy, rheumatism, disease of the heart or pericardium; the comparative frequency of these is in the order given. Relapses, from imprudence, are not uncommon. The sequels of the disease are sometimes more serious than the primary attack; often the most dangerous after a mild attack, or the reverse. Among these are consumption, probably in those in whom tubercles are latent at the time; obstinate chronic bronchitis; asthma, with profuse expectoration, especially in the aged, and difficult of relief; disease of the heart or pericardium; hemorrhage, due to phthisis or congestion of the lungs; dropsies, especially of the cavity of the chest; obstinate dyspepsia; rheumatism, or neuralgia. Unless when complicated with other and serious diseases, or occurring in those debilitated by age or excesses, or in infancy, influenza is seldom directly fatal; though it may become so through injudicious management of some of the maladies left in its train. The direct mortality is ordinarily about 2 per cent., sometimes higher.—The disease is distinguished from acute bronchitis, and from common catarrh-

al fever, by the greater nervous disorder and derangement of the digestive organs; by the difficulty of breathing, disproportionate to the other pulmonic symptoms; the pains in various parts; the cough, severe at the outset, with sleeplessness; the marked debility, and disposition to perspire; and by the fact of prevalence of the epidemic. The autopsy in fatal cases shows the trachea, bronchial tubes, and even the air cells more or less filled with a frothy muco-pus, sometimes bloody; the mucous surface of the affected parts dull red or livid; the substance of the lungs dark, and more dense; the organ tearing more easily than in health; the blood in the heart and large vessels dark; the mucous coat of the stomach often congested.—Investigation has long been baffled in the attempt to find the cause of this epidemic. Its general progress is almost invariably from east to west, sometimes turning northward or southward. It crosses the ocean as steadily and rapidly as the land; and in the recurrence in 1843, in New York, some were disposed to attribute its severity to the influence of cold, humid weather, along with the recent introduction of the Croton water, until it was found that ships' crews had been visited by it in various parts of the Atlantic. The resemblance in its course to that of Asiatic cholera is strong, and it has directly preceded and also followed that disease. It has been known to make the circuit of nearly or quite the entire globe. Prevailing usually about 6 weeks in any locality, until it exhausts its proper material, it affects about equally both sexes, all ages (though most frequently between those of 16 and 60), and all varieties of temperament and occupation; it is not contagious in any degree, and not to be kept at bay by the disinfectants thus far used; it attacks even the inferior animals, and sometimes these first of all. It has more frequently followed or attended seasons of severe cold, or damp and changeable weather; but it has appeared in mild and dry summers, and sometimes as severely as in the winter or spring. It has not been satisfactorily traced to prevalence of any winds, to ordinary conditions of the atmosphere, nor to electricity. Yet the cause is unquestionably a peculiar irritant of some kind in the air. This fact the Italian physicians recognized in 1775, when, imputing the disease to atmospheric influence, they gave it its present name. Dr. Graves suggested some "telluric influence;" Prout, the diffusion of selenium along with sulphur in the air, thrown out of volcanoes; and more recently the cause has been imagined to be the spread of minute animalcules or microscopic fungi, which are supposed to excite the mucous irritation observed. None of these views have been established; but all the facts touching the disease lend probability to the more recent suggestion, that the peculiar irritant is ozone, this modified or active oxygen being a very variable ingredient in the atmosphere, and supposed by its excess to originate influenza, while its absence is attended by Asiatic cholera. It is certain that

all debilitating excesses, fatigue, cold, &c., may during the epidemic act as immediate procuring causes of the attack; and that at such period the vital forces should be carefully husbanded.—The treatment of the disease may usually be simple, being essentially that of catarrh or mild bronchitis, with, however, more support, and little if any depletion. Bleeding is very rarely beneficial, and if resorted to should be slight and carefully watched. At the outset, diaphoretics should be given to restore action of the skin, and mild cholagogues and laxatives to remove disordered secretions. The moderately stimulant diaphoretics, as the camphor mixture, or solution of acetate of ammonia, are best. If the attack be more severe, a full dose of calomel or of blue pill, with James's powder, may be given at bedtime, followed in the morning by oil or senna. The diaphoretics may then be administered, with ipecacuanha or a few drops of antimonial wine added, so long as the fever is high, once in 3 or 4 hours. A warm bath at bedtime is very useful; and whenever heat is high, the surface may with advantage be sponged with tepid water, care being taken to avoid a chill; ventilation should be thorough. Should the cough be severe, the antimonial wine may be increased, with demulcents; or an emetic of eupatorium should be given, mustard or fomentations being applied to the chest when the pulmonic symptoms are severe. Other complications will require appropriate treatment. Blisters to the throat have been found injurious. After the decline of the fever, the supporting diaphoretics only should be given, with sponging, and care of the condition of the bowels, and perhaps the cough; and restorative tonics should be commenced as early as the symptoms will allow. The infusion of eupatorium, which taken warm is a good diaphoretic in the attack, serves, when taken cold, as a useful restorative in recovery. In this stage the diet may be more supporting; but care is necessary.

INFORMATION, in law, a written charge or accusation made against an alleged offender, stating some violation of law, before a court of competent jurisdiction to try the same. This process has taken the place of the ancient writ of *quo warranto*, and it is common to speak of it as an "information in the nature of a *quo warranto*." It is in substance, and to some extent in form, an indictment of the party; but an indictment can be found only by a grand jury, whereas an information is filed by an attorney of the state or United States, or other competent law officer, at his own discretion. Informations are sometimes filed for public purposes; but more often, in the United States, by some private prosecutor, who uses the name of the attorney-general to ascertain his rights, or obtain redress for some wrong. Although criminal in form, they are in their nature civil proceedings. When moved by a private person for his own purposes, he is called "a relator," and the case is entitled: "Information of A. B., attorney-general, *ex re-*

latione of C. D. against E. F." But no such use of an information was known to the common law, as it springs altogether from statute provision; first, from the statute 9 Anne, ch. 20, and afterward by various state statutes in this country, and by adjudication founded upon the statute of Anne, in states in which there is no statute provision respecting it. The general purpose of informations is to inquire into alleged usurpations of, or intrusion into, or unlawful claim or exercise of official or corporate powers or franchises. Thus, they are often brought against banks, alleging that they unlawfully exercise banking privileges, when the real question is, not whether they possess these powers or privileges, because they have been expressly conferred by the legislature, but whether they have not forfeited their charters by misconduct. So an information may issue against a medical school, to try its right of granting the degree of doctor of medicine with a corresponding diploma; or against the mayor of a city, to determine whether he has the right to admit freemen. The most important question is, how far informations will be granted to try questions which may be considered as of private right rather than public right. The court of king's bench refused to grant one against Sir William Lowther, to try the question whether he had the right to set up a warren, because it was of a private nature; and this principle has been applied with some severity in England. Here, however, informations are used very freely, to determine questions relating exclusively to private corporations, as banks, insurance companies, &c. But the following distinction is usually taken. An attorney-general may file what information he will, *ex officio*, without first obtaining the leave of the court; but if the information is from the relation of a private party, to try a private right, it will not be received by the court, nor will process issue thereon, until the leave of the court has been obtained to file the same. In general the court will not grant this leave where an adequate remedy at law is open to the relator; as where one sought an information against a turnpike corporation for going unlawfully through his land. The court will sometimes hear and decide the whole case on motion and argument; but if there be any question of fact, they will usually send the case to a jury. In general, they will refuse an information, or determine otherwise against the relator, where there has been long and negligent delay, or persons from whom title is derived are dead, or persons having adverse title or interest have long acquiesced in the alleged usurpation.

INFUSORIA, the name formerly given to numberless kinds of microscopic animalcules, the most minute of created beings, so called from their being especially abundant in water infused with vegetable matter. From their exhibiting the simplest forms of animal life, they were grouped together under the division *protozoa*; but such a division, supposed to differ from

all other animals in producing no eggs, does not exist in nature. Many are ascertained to be locomotive algæ or sea weeds; others are acephalous mollusks, embryonic worms, or crustacea. (See ANIMALCULES.)

INGELHEIM, NIEDER and OBER, two villages on the Rhine between Bingen and Mentz, belonging to the grand duchy of Hesse-Darmstadt, noted for their historical associations, especially Nieder Ingelheim, on account of a palace built there by Charlemagne, and in which he and some of his successors held diets, but the last ruins of which crumbled in 1831. The old church at Ober Ingelheim also contains many tombs and memorials attributed to the times of Charlemagne. The red wines of Ingelheim enjoy a high reputation.

INGEMANN, BERNHARD SEVERIN, a Danish poet and novelist, born in Torkildstrup, in the isle of Falster, May 28, 1789. He is the son of a Protestant clergyman, and was educated with the greatest care. He studied at the university of Copenhagen, published a volume of poems in 1811, and gained an academic prize for a dissertation on poetry and eloquence in 1812. He had produced two other collections of poems, a romantic epopee entitled the "Black Knights," and several dramas, as "Masaniello" and "Blanca," when in 1818 and 1819 he travelled in Germany, France, Switzerland, and Italy, and became intimately associated with Tieck. On his return he published two new volumes of brief poems, entitled *Reiselyren* ("Songs of Travel," 1820). Applying himself to the old national traditions, he produced numerous historical romances in imitation of those of Sir Walter Scott, as *Waldemar Seier* ("Waldemar the Victorious," 1826), *Erik Menved's Barn-dom* ("Childhood of Erik Menved," 1828), and *Kong Erik og de Fredløse* ("King Erik and the Outlaws," 1833), which have been translated into English; and poems on historical subjects, as *Waldemar den Store og hans Mand* ("Waldemar the Great and his Men," 1824), *Dronning Margareta* ("Queen Margaret," 1836), and *Holger Danske* (1837). Since 1822 Ingemann has been professor of æsthetics and Danish literature in the academy of Sorøe near Copenhagen. He excels especially as a lyrical poet. His complete works have been published at Copenhagen (39 vols., 1847-'56).

INGENHOUSZ, JOHANNES, a Dutch physician and naturalist, born in Breda in 1730, died at Bowood, England, Sept. 7, 1799. He was educated in his native country, and practised there some time as a physician. In 1767 he went to London to make himself acquainted with the new mode of inoculation. Having been recommended to the Austrian ambassador by Sir John Pringle, president of the royal society, he was sent to Vienna in the following year to inoculate the children of the imperial family. For his services on that occasion he was rewarded with the titles of aulic councillor and imperial physician, and a pension for life of £600. From Vienna he proceeded to Italy in

the spring of 1769, and afterward revisited Holland and Germany. In 1776 he returned to England. Most of his essays were published in the "Philosophical Transactions."

INGERSOLL, JARED, an American lawyer, born in Connecticut in 1749, died in Philadelphia, Oct. 21, 1822. His father, who had been in 1761-'2 appointed stampmaster-general for New England under the obnoxious stamp act, was forced by the indignant populace to resign his office, and was subsequently appointed admiralty judge for Pennsylvania, removing to Philadelphia. The son, having been graduated at Yale college in 1766, went to London, was entered of the Middle Temple, and passed 5 years in the study of law. The American revolution breaking out while he was still in London, he espoused the cause of the colonies, although the son of a loyalist. He went from London to Paris, where he remained for 18 months, making the acquaintance of Dr. Franklin. Returning home, he took up his residence in Philadelphia, where he passed the remainder of his life, and where he won almost immediately a prominent position as a lawyer. In 1787 he was chosen one of the representatives of Pennsylvania in the convention which framed the U. S. constitution. Twice attorney-general of the state, he was U. S. district attorney for Pennsylvania, and the appointment of chief judge of the federal court was tendered to him and declined. He was in 1812 the federal candidate for vice-president of the United States. At the time of his death he was president judge of the district court of Philadelphia co.—CHARLES JARED, an American statesman, lawyer, and author, son of the preceding, born in Philadelphia, Oct. 3, 1782. After finishing his collegiate course he studied law, and was admitted to practise before he became of age. He now travelled in Europe, became attached to the American embassy to France, and subsequently made a tour through a considerable portion of the continent with the Hon. Rufus King, the minister. Returning home, he was in 1805 appointed by Gov. McKean of Pennsylvania to an unimportant office. In 1811 he was as a democrat an unsuccessful candidate for the state legislature. In 1812, however, he was elected to congress, first taking his seat in May, 1813. He was again a candidate in 1814, and was defeated. In 1815 he was appointed by President Madison U. S. district attorney for Pennsylvania, an office which he held until he was removed in 1829 by Gen. Jackson. The reasons for Gen. Jackson's action in this matter being satisfactorily explained, Mr. Ingersoll was an ardent supporter of the administration of that president. Shortly after his removal, Mr. Ingersoll was elected to the legislature of Pennsylvania. He was a member of the canal and internal improvement convention which assembled at Harrisburg in 1825, and of the reform convention which sat in Harrisburg in 1837 and in Philadelphia in 1838. He was successively reelected to congress in 1840, '42, and '44, as

the representative of one of the districts of which the county of Philadelphia was then composed. In 1847 he was nominated by President Polk as U. S. minister to France, but his nomination was not confirmed by the senate. Since then he has resided in Philadelphia, taking no prominent part in public affairs. He has been a voluminous writer; his principal works are: "Chionara," a poem (1800); "Edwy and Elgiva," a tragedy (1801); "Inchiquin the Jesuit's Letters" (1810); "Historical Sketch of the Second War between the United States of America and Great Britain" (4 vols. 8vo., 1845-'52). It is understood that he has now (1860) ready for the press a work of considerable size and importance, entitled "A History of the Territorial Acquisitions of the United States."—JOSEPH REED, LL.D., D.C.L. Oxon., an American statesman and lawyer, brother of the preceding, born in Philadelphia, June 14, 1786, was graduated at Princeton college in 1804, and then commenced the study of the law, and subsequently entered upon its practice in Philadelphia. In 1809 he published a translation from the Latin of Roccus's tracts *De Navibus et Naulo* and *De Assccuratione*. He was for many years actively engaged in his profession, and enjoyed an extensive practice. In 1835, '6, and '7 he occupied a seat in congress as the representative of Philadelphia, but declined a reelection. In 1841, however, he again accepted a nomination as a whig, was reelected, and during the prolonged discussions in congress of the tariff question and other measures he took an active part, advocating the doctrine of protection. Mr. Ingersoll continued to represent the same constituency until March, 1849. By President Fillmore he was appointed minister to the court of St. James. Returning home after the expiration of Mr. Fillmore's term of office, he retired to private life, and now resides in Philadelphia.

INGHAM, a S. co. of the S. peninsula of Michigan, drained by the head waters of Grand river and by several smaller streams; area, 560 sq. m.; pop. in 1850, 8,631. It has a nearly level surface, timbered with sugar maple, beech, &c., and a fertile soil. The productions in 1850 were 94,721 bushels of Indian corn, 88,577 of wheat, 62,756 of oats, 28,447 lbs. of wool, and 8,837 tons of hay. There were 2 churches, 2 newspaper offices, and 2,936 pupils attending public schools. Coal and iron ore have been found in the county. Capital, Mason.

INGHIRAMI, TOMMASO, surnamed FEDRA, an Italian scholar, born in Volterra, Tuscany, in 1470, died in Rome, Sept. 6, 1516. In his infancy his family were obliged to flee from the vengeance of political opponents to Florence, where he was protected by Lorenzo de' Medici, by whose advice he went to Rome when 13 years old. Here, having undertaken to act the part of Phædra in Seneca's "Hippolytus," and some of the machinery having broken down during the performance of the play, Inghirami entertained the audience till the injury had been repaired

ed by the recitation of extempore Latin poetry. The multitude at once saluted him with the title of Fedra, which name he ever after retained. Alexander VI. made him a canon of St. Peter's, and he afterward became professor of rhetoric. In 1495 he accompanied the papal nuncio to the court of the emperor Maximilian, who created him count palatine and poet laureate. Julius II. appointed him librarian of the Vatican, and pontifical secretary. His most important works are, a "Defence of Cicero," "Compendium of Roman History," and "Commentary on Horace."

INGLIS, HENRY DAVID, a Scottish traveller and author, better known by his *nom de plume* of H. Derwent Conway, born in Edinburgh in 1795, died in London, March 20, 1835. He was educated for commercial pursuits, but abandoned them for literature and travel. His first work, "Tales of Ardennes," was received with great favor, and followed by "Solitary Walks through Many Lands," which was equally successful. His "Travels in Norway and Sweden," and "Tour through Switzerland, France, and the Pyrénées," appeared soon afterward in Constable's "Miscellany." Meanwhile he edited a newspaper at Chesterfield, which he relinquished for fresh wanderings on the continent, and on his return published "Spain in 1830" (2 vols. 8vo., 1831), a work of considerable value. After a short trial of journalism in the island of Jersey, he visited Ireland, recording his experiences in "A Journey throughout Ireland in 1834" (2 vols. 8vo., 1834). Mr. Inglis's other works are: "The New Gil Blas, or Pedro of Peñafior," "The Tyrol, with a Glance at Bavaria" (8vo., 1834); "The Channel Islands, Jersey, Guernsey, Alderney, &c." (2 vols. 8vo., 1835); and "Rambles in the Footsteps of Don Quixote," originally published serially in the "New Monthly Magazine."

INGLIS, SIR JOHN EARDLEY WILMOT, a British soldier, born in Halifax, N. S., in 1816. He is a son of the late John Inglis, bishop of Nova Scotia. Entering the army in 1833, he served with the 32d foot in Canada during the rebellion of 1837, and was subsequently ordered to India, where he took part in the Punjaub campaign of 1848-'9. He led one of the columns of attack at the storming of Mooltan, and was present at the battle of Gujerat, Feb. 21, 1849. For his gallantry in the latter engagement he received the brevet of lieutenant-colonel. He was with his regiment at Lucknow when that city was besieged by the mutineers in 1857, and on the death of Sir Henry Lawrence succeeded to the command of the garrison. The heroic defence of Lucknow made Col. Inglis's name familiar in all parts of England and America. He received for his services the brevet of major-general in 1857, and was made knight commander of the bath in 1858.

INGOLSTADT, a fortified town of Upper Bavaria, on the left bank of the Danube, at the confluence of the Schutter, 35 m. S. W. from Ratisbon, and the principal place between that city and Donauworth; pop. 12,000. The de-

fences of the town were demolished by the French after a 3 months' siege in 1800, but were restored from 1827 to 1847 with all modern improvements of fortification. Its Roman Catholic university, founded in 1472, and long famous, was transferred in 1800 to Landshut. The first Jesuit college established in Germany was founded at Ingolstadt in 1555. In 1632 the town sustained a siege by Gustavus Adolphus.

INGRAHAM, DUNCAN NATHANIEL, an American naval officer, born in Charleston, S. C., Dec. 6, 1802. He entered the navy as midshipman in Jan. 1812, and became a captain, Sept. 14, 1855. While in command of the sloop of war *St. Louis* in the Mediterranean, he arrived at Smyrna, June 22, 1853, and upon anchoring was informed by the American consul that Martin Koszta, a Hungarian by birth, but entitled to the protection of the United States, was a prisoner on board the Austrian brig of war *Hussar*, then lying near the *St. Louis*. Capt. Ingraham immediately went on board the *Hussar*, had an interview with Koszta, and learned that he had resided a year and 11 months in New York, where he took the usual oath of allegiance to the United States in July, 1852, and was in possession of a legalized copy of a declaration which he then made of his intention to become an American citizen; that he had come to Smyrna from New York on business, intending soon to return; that on the afternoon of June 21, while seated on the Marina of Smyrna, he was seized by a party of armed Greeks, employed by the Austrian consul-general, thrust into a boat, and carried on board the *Hussar*, where he was held in close confinement. Capt. Ingraham immediately addressed a letter upon the subject to Mr. Brown, the chargé d'affaires of the United States in Constantinople, who officially expressed the opinion that the surrender of Koszta should be demanded. Capt. Ingraham accordingly, on July 2, at 8 A. M., demanded of the Austrian commander the release of Koszta by 4 P. M., declaring that he would otherwise take him by force. At this time a steamer was lying near the *Hussar* ready to carry the prisoner to Trieste. At 11 o'clock the Austrian consul-general proposed, though under a protest, to deliver Koszta into the hands of the French consul, to be held by him subject to the disposition of the consuls of the United States and Austria, and not to be delivered without their joint order. In the agreement drawn up, the ministers of the United States and Austria, and the consuls of the two powers, were to give their assent to the delivery of Koszta. As this proposition gave sufficient assurance of the personal safety of Koszta, Capt. Ingraham accepted it, and the Hungarian was soon set at liberty and returned to the United States. This affair was elaborately discussed at Washington, between M. Hülsemann, the chargé d'affaires of Austria, and Mr. Marcy, secretary of state. The conduct of Capt. Ingraham was fully approved by the government, and congress by

joint resolution, Aug. 4, 1854, requested the president to present a medal to him for his conduct on this occasion. In March, 1856, he was appointed chief of the bureau of ordnance and hydrography of the navy department, which position he still retains.

INGRAHAM, JOSEPH H., an American author, born in Portland, Me., in 1809. After a brief experience of mercantile life he became a teacher in Washington college, near Natchez, Miss., and in 1836 published his first book, "The South-West, by a Yankee." Thenceforth he embarked in an active literary career, producing in rapid succession "Lafitte," "Barton, or the Sieges," "Captain Kyd," "The Dancing Feather," and a number of other romances, some of which attained a large circulation. Several years ago he was ordained a minister of the Protestant Episcopal church, and he is now rector of a parish and of St. Thomas's Hall, an academy for boys, in Holly Springs, Miss. His last important works are the "Prince of the House of David" (12mo., New York, 1855) and the "Pillar of Fire" (12mo., 1859).

INGRES, JEAN DOMINIQUE AUGUSTE, a French historical painter, born in Montauban, Sept. 15, 1781. He was intended for a musician, but having persuaded his father to allow him to study painting, he was placed in the school of David, where he made such rapid progress that by the age of 20 he had gained in two successive years the 1st and 2d prizes of the academy of fine arts. In 1806 he departed for Italy, where he passed nearly 20 years, abandoning, under the influence of a close study of Raphael and the old masters, the dry, classic style he had acquired from David. His works are numerous, and comprise generally serious historical and classical subjects; in the great exhibition of 1855 at Paris an entire saloon was appropriated to them. Many are in the Louvre, on the ceiling of one of the apartments of which is painted his "Apotheosis of Homer." His "Stratonice," painted for the duke of Orleans, was sold in 1853 for 40,000 francs. Among his latest works is the "Apotheosis of Napoleon I.," painted on the ceiling of the *hôtel de ville* in Paris. He has painted the portraits of many distinguished personages, from Napoleon I. downward. Ingres is adjudged to hold a middle place between the classic and the romantic schools.

INGRIANS, a tribe in the Russian government of St. Petersburg, belonging to the Karelian branch of the Finns, now reduced to about 18,000, in about 200 small and wretched villages. The Ingrians are poor and ignorant, but begin to assimilate more with the Russians; and many have recently forsaken the Protestant religion, which is that of the majority, for the Greek church. The Ingrians derive their name from the river Inger or Ischora. The strip of land between the Neva, the lake of Ladoga, the gulf of Finland, the Narva, and the governments of Pleskov and Novgorod, was called Ingermannland or Ingria by the Swedes, who obtained possession of it at the beginning of the 17th

century. Reconquered by Peter the Great, at the beginning of the 18th, it has formed since the latter part of that century the greater part of the government of St. Petersburg.

INGULPHUS, a learned English monk, born in London about 1030, died at the monastery of Croyland, Dec. 17, 1109. He was educated at Oxford, where he applied himself particularly to the study of Aristotle and Cicero. In his boyhood he had attracted the attention of Editha, queen of Edward the Confessor, who afterward became his patroness, and introduced him to William, duke of Normandy, during that potentate's visit to the English monarch. On returning to the continent the future conqueror took the young Saxon in his train, and ultimately made him his secretary. In 1064 he resigned office at the court of Normandy, and accompanied Sigfrid, duke of Mentz, on a pilgrimage to the Holy Land. After this pilgrimage he became a monk in the abbey of Fontenelle, in Normandy, where he remained till 1076, when he was invited to England by William, and appointed abbot of Croyland, which office he held to the time of his death. The celebrated *Historia Monasterii Croylandensis*, from 664 to 1089, was long regarded as the work of Ingulphus, but Sir Francis Palgrave has demonstrated that it is the production of a later age. A translation of it forms one of the volumes of Bohn's "Antiquarian Library."

INJUNCTION, a prohibitory writ. Courts of equity grant relief by injunction in those cases in which, but for their interposition, an equitable right would be infringed. In such cases courts of law can afford no remedy, for they cannot adjudicate upon an equity, and are powerless to prevent an invasion of it. Where then the rights of a party are wholly equitable in their nature, he can find no redress in the common law tribunals; but the mere existence of an equitable element in a suit being regarded by these courts as no bar to their procedure, they take jurisdiction, and, in deciding upon the legal merits of the case, disregard the equity, because its recognition does not lie within their competence as courts of law. It is in such cases as these that a court of equity, in the exercise of its distinctive jurisdiction, will interpose by injunction to protect the equity. This protection consists in restraining in behalf of the plaintiff the commission or continuance of some act of the defendant. An injunction is defined to be a writ, framed according to the circumstances of the case, commanding an act which the court regards as essential to justice, or restraining an act which it esteems contrary to equity and good conscience. As examples of those cases where relief is afforded to rights, which either are wholly equitable, or under the circumstances of the case are incapable of being asserted in courts of law, may be cited instances in which trustees are enjoined from using their legal title to oust the possession of those who are equitably entitled to the benefit and enjoyment of the trust estate; so tenants for life or mort-

gageors in possession, who are not punishable at law for committing waste, will be enjoined in equity from doing so; and again, mortgageors in possession, though in some sense owners of the mortgaged estate, will yet be restrained by injunction from so reducing its value as to impair the security of the mortgagee. The administration and marshalling of assets, and the marshalling of securities, furnish other illustrations of the interposition of courts of equity by injunction to control the proceedings of creditors and others at law, and upon principles almost purely of an equitable nature.—A second class of cases includes those in which an equitable element is involved, but the matter of which otherwise is cognizable at law. If in such cases the courts of law have already taken jurisdiction, a court of equity will in a proper case restrain their further procedure. Thus, when fraud, accident, or mistake has given one party to the suit an unfair advantage over his opponent, an equity arises in favor of the latter which will be protected by injunction. For example, the defences of one suitor may rest wholly in the knowledge of the other, and equity will forbid the trial until the defendant has had time to possess himself of such information; or where, after judgment against the defendant at law, a receipt is found, showing the payment of the very debt upon which he has been condemned, if there be no remedy in such a case at law, equity will enjoin, and so prevent, the execution of the judgment. Equity will also relieve against torts. The ground of interference here is, that between the complete right of the plaintiff and the largest remedy which he can receive at law for the wrong done him, there lies an equity which is not protected; this may rest either in the inadequacy of the money compensation which the plaintiff recovers, or in his right to be exempted from vexatious litigation. The equity jurisdiction in these cases is most frequently exercised in respect to waste, nuisances, and infringements of patent rights and of copyrights. The remedies at law in all these cases are similar. To cite alone that of nuisances, they can at most only abate or afford compensation for existing nuisances, but are ineffectual to prevent such as are threatened or in progress; if, however, the complainant's right be clearly admitted or established at law, and the nature of the threatened injury be such that it cannot be compensated by damages, or will occasion a constantly recurring grievance, equity has jurisdiction to enjoin. Further, as examples of the equitable relief afforded by injunction, it may be mentioned that courts of equity will restrain the unjust conveyance of real property or the transfer of stocks during the pendency of suits which concern them; they will forbid the publication of private papers, letters, or manuscripts; they will enjoin a husband's transfer of property in fraud of the legal or equitable rights of the wife; and will compel the due observance of personal covenants where there is no effectual remedy at law.—In the cases thus re-

viewed, the court of equity issues the injunction by its remedial writ. The judicial writ is in the nature of an execution, and issues subsequently to a decree of the court. Injunctions may be either temporary, when they are granted for a limited time, or until the filing of the defendant's answer, or the hearing of the court; or perpetual, when in the opinion of the court, after a hearing of the merits of the case, the plaintiff has established his right to such relief.

INK, the name given to a variety of preparations designed for producing colored letters in writing or printing. The ink of the ancients appears to have been of similar character to the solid Chinese or India ink—a combination of lampblack with glue or gum, in the proportions, as given by Dioscorides, of 3 parts of the former to 1 of the latter. The liquor of the cuttle fish is also stated to have been in use for ink (Cicero, *De Natura*; Pliny, lib. xvi. cap. 64). In writing, the ancients employed the preparations made fluid, using a style with a split point. Manuscripts written from the 5th to the 12th century are generally very legible, while those of the 15th and 16th centuries are made out with difficulty in consequence of the discoloration of the ink. This is owing in the one case to the permanent quality of the ancient inks, which were of the nature of a black paint, and also to the use of parchment and of a porous paper of cotton rags which absorbed the ink; and in the other to the closer quality of the linen paper of the later period, and the changeable nature of the ink, which was in fact a dye prepared from nutgalls and sulphate of iron. Paper bleached with excess of chlorine would cause this kind of ink to be discolored. The decay of the vegetable portion of the ink would cause the color to fade, and ancient writings thus rendered illegible have been restored by careful application of an infusion of galls. In an essay on the "Origin and Progress of Printing," privately printed by the Philobiblon society in England, 1859, it is stated: "The ink of the ancients, and that used in the middle ages, had a consistency much thicker than that at present in use; very highly gummed when applied to papyrus, parchment, or paper, it formed letters in relief, as if they were embossed, which has given rise to an erroneous conjecture that these writings were produced by a sort of typographic process. Black ink was in general used for manuscripts and charters. The basis of all the black inks was carbon in various forms, as lampblack. Red ink was generally employed for printing initials and the titles of books and chapters; hence the term rubrics, from *rubrica*, red. At Orleans there is a charter of Philip I., dated 1090, written in green ink. The emperors signed in purple ink obtained from the *murex*; gold and silver inks were chiefly employed on colored parchments or purple vellum. The celebrated codex of Upsal is written with silver ink upon violet parchment, the initials and some passages being in gold."—Though the same materials were used for several centuries

past that are now employed for the best inks, little was known of the real nature of the compounds produced until the researches of Dr. Lewis and of Ribaucourt toward the close of the last century; the latter published an interesting paper containing an account of his observations in the *Annales de chimie* of 1798. The inks from that time were improved; but the receipts have until recently been objectionable from the introduction of unnecessary ingredients, and particularly from the necessity of employing much gum to prevent the coloring matter from subsiding; this renders the ink thick and indisposed to flow freely from the pen. The requisites of a good writing ink are permanency of character, close adherence to the paper, a good color, no tendency to mould, and a proper consistency. A combination of nutgalls with sulphate of iron was long the only suitable black solution known. The galls produce probably 4 vegetable principles which unite with the oxide of iron, viz., gallic and tannic acids, mucilage, and extractive matter. The acids are regarded as more particularly necessary to a good ink, forming with the oxide of iron of the copperas a tanno-gallate of iron. Of the 3 causes of the deterioration of ink—mouldiness, the separation of the black coloring matter, and the change of color—Dr. Bostock, in an able paper in the "Transactions of the Society of Arts," 1830, attributes the 1st to the mucilage, the 2d to the extractive matter, and the 3d to the tannin, which is disposed to decompose and thus involve the destruction of the compound of which it is an ingredient. The more nearly the ink approaches the composition of a gallate of iron, the more permanent he regards it. Several of the receipts require long exposure of the decoction of galls to the air, after this is obtained by boiling in water, the effect of which is to convert much of the tannin into gallic acid. Dr. Bostock recommends that the galls should be macerated for some hours in hot water, and the fluid filtered; the filtrate should then be exposed for 2 weeks to a warm atmosphere, when any fungoid growth that forms must be removed; and the infusion being made stronger than usually directed, no addition of mucilaginous substance will be required to give it a proper consistency. The solution of sulphate of iron should also be boiled or exposed some time to the air, which causes a portion of sesquioxide of iron to be formed, the presence of which is advantageous. When the ink becomes thick by evaporation, Dr. Bostock recommends as the best fluid for diluting it a strong decoction of coffee. The receipts for this class of ink alone are very numerous. That of Booth for a fine black ink is: Aleppo galls 12 lbs., sulphate of iron 4 lbs., gum Arabic 3½ lbs., water 18 gallons; the bruised galls to be exhausted by 3 successive boilings, each time with a reduced quantity of water; the decoction is strained, and while warm the solution of the gum and copperas, also warm, is to be added, and the mixture is left for several weeks to deposit its sediment. A few drops of creosote

added will prevent mouldiness.—Among the other kinds of ink, the following appear particularly worthy of notice. The blue ink first introduced by Mr. Henry Stephens of London, remarkable for a blue color which soon after drying changes to deep black, for perfect fluidity, and tenacious adherence to the paper, is a tannogallate of iron dissolved in sulphate of indigo, the coloring matter thus not being suspended as in the ordinary inks, but in complete solution. Another variety, also invented by Mr. Stephens, and remarkable for its tendency to fade by continued exposure to light, and to recover its hue when excluded from it, is made by submitting Prussian blue for two days or longer to the action of strong nitric or hydrochloric acid, then washing it well with water till all acid is removed, and finally dissolving it in oxalic acid. Hornung's receipt is to mix 4 parts of solution of perchloride of iron with 750 parts of water, and precipitate with 4 parts of cyanide of potassium in solution; the precipitate collected is washed with several additions of water, and allowed to drain until it weighs about 200 parts; it is then dissolved in one part of oxalic acid. Runge's ink, remarkable for its clearness and fitness for steel pens, which it does not corrode, is a cheap composition prepared by gradually adding one part of solution of chromate of potash to 1,000 parts of a strong cold decoction of logwood, 22 lbs. of logwood being boiled down with water to 14 gallons. The ink thus made is very black, and is not affected by weak acids, nor can it be washed out with water. Dr. Normandy's indelible writing ink, which is remarkably permanent, is made by grinding 24 lbs. of Frankfort black with mucilage, obtained by adding 20 lbs. of gum to 60 gallons of water, straining through a coarse flannel, then adding 4 lbs. of oxalic acid, and as much decoction of cochineal and sulphate of indigo as will give the required shade. Berzelius invented an ink which he regarded as the best writing ink known, and also nearly indelible; it is vanadic acid combined with ammonia and mixed with infusion of galls.—Copying inks, which are intended to give an impression of the writing made with them to a second or a third sheet moistened and pressed upon the original, are the ferro-gallic inks with a larger proportion of gum than they usually contain, and a portion beside of sugar or of sugar candy.—Red ink may be made by the receipt of Heusler, which is to boil 2 oz. Brazil wood, $\frac{1}{2}$ oz. alum, and the same of crystals of tartar, in 16 oz. of pure water, till it is reduced one half; in the strained liquor $\frac{1}{2}$ oz. of gum Arabic is to be dissolved, and a tincture added made by digesting $1\frac{1}{2}$ drams of cochineal in $1\frac{1}{2}$ oz. of alcohol of specific gravity 0.839. Booth employs Brazil wood 2 oz., chloride of tin $\frac{1}{2}$ dram, gum Arabic 1 dram, water 32 oz., and boils down to 16 oz. Various receipts may be found for different colored inks, but there is little use for them. They are generally composed of coloring matter held in suspension by thickening the liquid with

gum Arabic. The nature of the Chinese or India ink has been already noticed. Proust states that lampblack purified by potash lye and mixed with a solution of refined glue, moulded and dried, makes a quality of this ink preferred by artists even to that of China. Until some recent discoveries it was supposed that this ink used with acidulated water was inattackable by chemical reagents that were not destructive to the paper.—The so called indelible or marking inks were formerly altogether made by dissolving nitrate of silver in water and adding gum Arabic and sap green, and were used in connection with a pounce, which was first applied to the linen on the spot to be marked. The pounce was an aqueous solution of carbonate of soda to which gum Arabic was added. The best marking inks are now made by combining the two preparations at once, and bringing out the color after the application to the cloth by exposure to heat. A good ink is made by dissolving 7 parts of carbonate of soda in 12 of water, and adding 5 parts of gum Arabic, then mixing with this 5 parts of nitrate of silver liquefied in 10 of ammonia; the mixture is to be gradually heated to ebullition in a flask, when it becomes very dark and of the proper consistence. Tartaric acid is sometimes advantageously employed to produce tartrate of silver, as by the following process: nitrate of silver is triturated in a mortar with an equivalent of desiccated tartaric acid; water added causes crystals of tartrate of silver to separate with liberation of nitric acid; this is neutralized by careful addition of ammonia, which also dissolves the tartrate of silver; the preparation is then thickened with gum, and coloring matter is added at pleasure. The Italian marking ink is terchloride of gold applied to cloth moistened with solution of chloride of tin. The subject of indelible inks will be further treated under NITRATES.—Sympathetic inks are preparations which when used for writing leave no visible, or at least only colorless, marks upon the paper. These are afterward brought out in colors by exposure to heat or to moisture, or by application of other substances. By the ancients it was known that new milk or the milky sap of plants might be so used, the writing with it being made visible by dusting over it a black powder. The property of writing made with the solution of acetate of lead to turn black by application of gaseous or liquid sulphuretted hydrogen was known in the 17th century, and ascribed to magnetic influences. The action was afterward styled sympathetic, and the name has continued to be applied to the various preparations of this nature. The materials of the common ferro-gallic inks may be used separately for a sympathetic ink, the writing being done with the sulphate of iron solution and washed over with that of the galls, as the writing of some old manuscripts is now occasionally restored. A dilute solution of chloride of copper used for writing is invisible until the paper is heated, when the letters are seen of a beautiful yellow, disappearing with the heat that devel-

oped them. The salts of cobalt, as the acetate, sulphate, nitrate, and chloride, possess a similar property, the letters appearing blue. The addition of a salt of nickel renders them green. The magic or chemical landscapes are made by the use of these metallic salts. The sky being painted with the salt of cobalt alone, and the foliage with the same mixed with nickel, the application of heat brings them out in their appropriate colors. A winter landscape, with the bare trees and ground covered with snow, may thus by accession of warmth be clothed with the green hues of summer.—Lithographers employ an ink for tracing designs on paper, which are to be transferred to stone, composed of shellac 1½ oz., soap 2 oz., white wax 3 oz., tallow 1 oz., a strong solution of gum sandarach 3 tablespoonfuls, and lampblack; also an ink for taking impressions from engraved plates, which are to be transferred to stone, composed of tallow, wax, and soap, each 4 oz., shellac 3 oz., gum mastic 2½ oz., black pitch 1½ oz., and lampblack.—Printing ink is a preparation very different from any of the inks used for other purposes; and its manufacture demands no little skill and experience. It is made in various methods, not always with the same materials, and the processes are often kept secret. It should be of a soft adhesive character, readily attaching itself to the surface of the types, and as easily transferred in part to the paper pressed upon them, conveying in a clear tint the exact stamp. Thus spread in a thin film and pressed into the paper, it should quickly dry, and at the same time be so incorporated with the paper as not to be removable by mechanical means, while its composition insures for it durability and a power to resist the action of chemical agents as well as atmospheric influences. While disposed to dry readily on being applied to paper, it should retain its softness in the mass and while excluded from the air, and in this condition undergo no change. Its ingredients must not be of a corrosive nature to injure the rollers employed in spreading it. The appearance of good ink is glossy and somewhat oily; its texture smooth without grains; and its tenacity such as to cause it to adhere to the finger pressed against it, and yet leave but a short thread suspended from a portion taken out. The usual materials employed in its manufacture are linseed oil, rosin, and coloring matters. Other ingredients are sometimes introduced, as soap and slices of bread, the latter intended for absorbing grease that remains in the oil when it is long boiled. Rosin oil is largely used for some of the cheaper inks. For the best inks the linseed oil is selected of the purest quality, and this is clarified by digesting it for some hours with dilute sulphuric acid at a temperature of 212°, and then washing it with hot water; it will then dry much more quickly. The oil is then boiled, and the inflammable vapors that rise are ignited, and after burning a few minutes a cover is placed over the vessel, extinguishing the flame. The boiling is not stopped until a drop taken

out and placed on a cold surface is covered with a film as it cools. A portion of rosin is then dissolved in the oil, the quantity depending on the degree of stiffness the ink may require; that for books and strong, stiff paper bearing more rosin, and receiving in consequence more gloss, than the ink for newspapers. The degree of viscosity given to the oil should also have reference to the use required of the ink. Lampblack is almost universally employed as the coloring matter; and much care is given to the manufacture of this article to obtain it for this purpose of the very best quality. Other carbonaceous blacks reduced to impalpable powder are sometimes employed. For colored inks various pigments are introduced instead. The mixture is made with the hot compound of burnt oil and rosin in a cylindrical vessel, in which a revolving shaft with arms serves as a stirrer. From this the ink is drawn off, and is then ground in a mill until the ingredients are thoroughly incorporated. Various receipts may be found in Ure's "Dictionary" and Muspratt's "Chemistry" for printing inks of other materials than the above. For ancient processes the reader is referred to the work of Caneparius, *De Atramentis cujuscumque Generis* (Rotterdam, 1718).

INKERMAN, a Russian village in the S. of the Crimea, on the site of a ruined city, at the head of the harbor of Sebastopol, and 35 m. from Simferopol. It stands at the foot of a hill rising several hundred feet perpendicularly above the valley of the Tchernaya, crowned by massive walls and remains of towers, which prove the former importance of the place. The side of the hill is pierced by numerous artificial caves, hewn from the solid rock, resembling the ruins found in Idumæa, but unlike any others in Europe. Near by is a church similarly constructed. The caves were probably made by the persecuted Arians, and were afterward occupied by Christian cenobites, as is shown by the paintings, chapels, and remains of altars found in them. Inkerman is supposed to occupy the site of the Ctenos mentioned by Strabo. On the heights of Inkerman, on the side of the valley opposite to the ruins, a great battle was fought, Nov. 5, 1854, between the Russians and the allied French and English. The Russians lost in killed 3,011 and wounded 5,997; the English 462 killed and 2,143 wounded; the French 389 killed and 1,337 wounded.

INMAN, HENRY, an American artist, born in Utica, N. Y., Oct. 20, 1801, died in the city of New York, Jan. 17, 1846. From early boyhood he manifested a taste for art, and about the year 1812 his parents removed to New York, where he was enabled to study drawing. In 1814 a cadet's warrant was procured for him, and he was preparing to enter the West Point academy when Jarvis the portrait painter offered to receive him as a pupil, and he was bound an apprentice for 7 years. He was soon able to work upon the same canvasses with his teacher, whom he accompanied to New Orleans and

other cities. Upon the conclusion of his apprenticeship he devoted himself to portrait painting. After a successful career in New York he removed to Philadelphia, in the neighborhood of which he had purchased an estate; but he soon returned to New York, which was thereafter his permanent place of residence. Among his most characteristic portraits are those of Chief Justice Marshall, Bishop White, and Jacob Barker. He painted also landscape, *genre*, and history. In 1844 the infirm state of his health led him to visit England, where he was the guest of Wordsworth, whose portrait he painted, and at whose suggestion he executed his "Rydal Water," near the poet's residence. During his residence in England he also painted portraits of Dr. Chalmers, Lord Chancellor Cottonham, and Macanlay. On his return to New York in 1845 he commenced the execution of a commission from congress to furnish a series of historical paintings for the national capitol. He was engaged upon the first of these, representing the cabin of Daniel Boone in the wilds of Kentucky, at the time of his death. A collection of 127 of his paintings was exhibited for the benefit of his widow and children.

INN (anc. *Enus*), the largest Tyrolese river, one of the principal tributaries of the Danube, rises out of the small lake of Longhino at the foot of Mont Longhino, one of the E. declivities of the Septimer Alps, on the confines of the Maloia and on the S. E. slope of the Engadine, at an elevation of about 6,000 feet, in the Swiss canton of Grisons, crosses the Grisons frontier above the gorge of Finstermüntz, and enters the Tyrol by a narrow valley, through whose northern district, particularly the Upper and Lower Inn valleys, it runs with great impetuosity to the border of S. E. Bavaria, which it crosses at Eichelwang. After a course of about 100 m. in the Tyrol, it runs N. and then E. for about 90 m. through Bavaria to Brannau in Austria, whence it flows in a N. direction, forming the boundary between Bavaria and Austria, until it joins the Danube near Passau, after an entire course of about 300 m. Steamboats ply on the Inn, and (since 1857) on its largest tributary the Salzach. The most important towns on the banks of the Inn are Kufstein and Innspruck. The beautiful valley of the Engadine, which is situated near the sources and extends along the banks of the Inn, is also called the valley of the Upper Inn, where in the Romansch language, which is spoken by the inhabitants, the name of the river is On.

INN has been judicially defined as "a house where the traveller is furnished with every thing which he has occasion for while on his way." It is sometimes important to determine whether a house be an inn and the master an innkeeper, because of the legal rights, on the one hand, and on the other the peculiar and stringent liabilities, of an innkeeper. It is clear that while a sign is the usual and proper evidence that a house is an inn, it is neither essential to an inn nor the only evidence of it.

A mere coffee house, or an eating room, is not an inn. Neither is a boarding house; but the distinction between a boarding house and an inn is not always easy, in fact or in law; and it is the more difficult, because the same house may be an inn as to some persons within it, and a boarding house as to others. The best test of this question we apprehend to be the transiency or the fixedness of the alleged guest. The old law constantly held that, an inn is for the benefit *transientium*. By this is not meant that a guest of an inn loses his rights, or that the innkeeper loses his rights over him, if the guest remains a long time in the inn, provided he remains there as in an inn; and he does so, if he makes no contract, and comes under no obligation, to stay a moment longer than he chooses to. If he goes to an inn, occupies his room, and takes his meals, with the right at any moment of going away, and of paying for what he has had up to that moment, and nothing more, he continues to be a guest although he remain there a year or years. But if, upon going there, or at any time afterward, he makes a bargain by force of which he must stay at least so long, whether it be a week or a month, he is no longer a "transient person," and therefore loses the peculiar character of a guest at an inn. And it has been held, that he remains as a guest at an inn, although he expects to stay a certain time, and a price is agreed upon accordingly, but to be more if the guest sees fit to go earlier. (7 Cushing, 417.)

INNKEEPER. Public policy imposes upon an innkeeper a heavy responsibility, as has been intimated in the articles BAILMENT and INN. It seems to be settled law, that he is liable as an insurer of the property of his guests within his charge, against every thing but the act of God or the public enemy, or the negligence or fraud of the owner of the property. He would therefore be liable for a loss caused by his own servants, by other guests, by robbery within or from without the house, burglary, riots, or mobs; for a mob is not a public enemy in this sense. It is however a good defence to the innkeeper, that his guest's loss was caused by the guest's servant or company, or by his negligence of any kind; or that the property was never in charge of the innkeeper because the guest had retained it in his own possession and under his own control. This last defence, however, is not made out by merely showing that the guest received and accepted a key of the room or of a closet, or that he exercised some preference and gave some directions as to where the property should be placed. But still an innkeeper may protect himself by requiring reasonable precautions from the guest. Thus, if he appoint a certain place of deposit for certain goods, as a safe for money or jewelry, with notice to his guests that he will not be responsible for their property of this kind if not put there, and a guest disregard this, the innkeeper is exonerated. But no especial delivery of the goods to the innkeeper is necessary

to charge him, if they are in his custody in the usual manner. It is also held, at least in England, that he cannot refuse to receive a guest without good cause, as that his house is full, or that the guest is disorderly, or has infectious disease, or disreputable habits or appearance. On the other hand, a guest has no right to select and insist upon a particular apartment, or put it to other purposes than those for which it was designed. Nothing need be paid for the goods, separately, to charge the innkeeper; but they must be the goods of a guest. It has been formerly held, perhaps in England, and certainly in Massachusetts (but in consequence of a mistaken view, as we think, of an English case), that if the goods are sent to the innkeeper, or even if a horse, carriage, and harness be placed in his stable, although the owner be not personally a guest, the innkeeper is liable for their loss without fault on his part. But this has been very properly overruled, both in England and in this country, especially in New York, and an innkeeper held liable, as such, only for the goods of those who are actually in his house as guests.—An innkeeper is of course liable like any other person for any loss or injury caused by his own default or negligence; and so a boarding-house keeper is liable to this extent. But an innkeeper is liable for the loss of or injury to property of a guest, without the innkeeper's own default of any kind. So, if he receive the horse and carriage of a guest, and put them under an open shed, away from his premises, or leave them in the open road, because he is crowded, and is accustomed to put them there when crowded, he is still liable for them as insurer. It is said, however, that if the innkeeper puts the horse in a pasture with the knowledge and consent of the owner, or perhaps with his knowledge and silence, he is not liable unless for his own fault. On the other hand, and perhaps as some compensation for these stringent liabilities, an innkeeper has a lien on the goods of his guest, for his charges against the guest; and he even has this lien on a horse or carriage, or other property stolen and brought to him by the thief. He has no lien on the person of the guest; and certainly none on the clothing actually at the time on his person. But the innkeeper's lien probably reaches all other property of the guest, and extends so far as to cover the whole amount due by the guest, for himself, his servants, or his animals. But where a person visits an inn by special invitation as a friend, or by general invitation as one of many, or as one of the public, on a certain day, without paying or being expected to pay any thing, it has been recently held that the innkeeper is liable to the visitor only for losses or injuries caused by the innkeeper's own default or neglect.

INNOCENT, the name of 13 popes, of whom the following are the most important. I. SAINT, successor of Anastasius I., born in Albano, elected April 27, 402, died March 12, or, according to Baronius, July 28, 417. On his accession

he interceded but without avail in behalf of Chrysostom, who, through the empress Eudoxia's displeasure, had just been deposed from the see of Constantinople and exiled to Bithynia. The Donatists having been condemned by the council of Carthage (405), he persuaded the emperor Honorius to enact severe laws against them. On the invasion of Italy by Alarie at the head of the Visigoths, he tried to save Rome from these barbarians, and went to Ravenna in order to solicit the interference of the emperor; but during his absence the city was taken, Aug. 24, 410, and plundered. After the departure of the Goths, Innocent returned to Rome and exerted himself to relieve the ruined metropolis. His zeal and charity endeared him to the Romans, heathen as well as Christian. He condemned the doctrines of Pelagius, who was supported by some Christians in the East, and evinced great severity against the Novatians, who were numerous in Italy. Thirty letters attributed to him have been printed in Labbe's *Concilia*, vol. ii.; and Gennadio, in his *De Scripturis Ecclesiasticis*, has given also as his a *Decretum Occidentium et Orientalium Ecclesiis adversus Pelagianos datum*, which was published by his successor, Zosimus I. II. GREGORY DE' PAPA, born in Rome, elected Feb. 14, 1130, died Sept. 13, 1143. He was first a monk and afterward abbot of the convent of St. Nicholas, was promoted to a cardinalship by Urban II., and appointed in 1124 legate to France by Calixtus II. His virtues, eloquence, and sweetness of temper secured him the affections of his colleagues; and on the death of Honorius II., before the event could be generally known, he was somewhat hastily proclaimed pope by 17 of them; but some of the cardinals who were dissatisfied met in the evening of the same day and gave their vote in behalf of Pierre de Leon, who assumed the appellation of Anacletus II. Pierre was possessed of immense wealth, which he lavished to make himself popular among the Romans. He was soon acknowledged all over Italy, while Innocent was obliged to take refuge in France. Being here supported by the celebrated St. Bernard, the leading spirit of the age, he was welcomed by King Louis VI., the nobles, and the French clergy. A council was convoked at Rheims, where his election was unanimously confirmed, and Anacletus was excommunicated. He then returned to Italy, held a council at Piacenza, and being soon joined by King Lothaire at the head of an army, reentered Rome, May 1, 1133. He rewarded his royal ally by crowning him emperor in the church of St. John Lateran. Anacletus, however, still held possession of the castle of St. Angelo and several fortresses; he was also supported by Roger king of Sicily; and Innocent was again driven from Rome, to which he did not return until the death of his opponent in 1138. He had now to negotiate for the abdication of Victor IV., another anti-pope who had succeeded Anacletus, and to secure the submission of the rebellious cardinals. He was then enabled to

hold the second general council of Lateran, which was opened April 8, 1139, and attended by more than 1,000 bishops. His trials, however, were not at an end; he was attacked by King Roger, and being taken prisoner, could only regain his liberty by confirming this prince in the possession of Sicily and the title of king, which had been bestowed upon him in 1130 by Anacletus. Yielding to the entreaties of St. Bernard, he condemned in 1140 the heretical opinions of Abelard; but soon becoming embroiled in a quarrel with Louis VII. of France, he put his kingdom under an interdict. This difficulty was not yet settled, when the Romans, discontented with some of the pope's measures, and excited by the liberal doctrines of Arnold of Brescia, rose in arms against Innocent, and reëstablished the senate and the tribunes of ancient Rome. The pope died soon after. Forty-three letters of Innocent II. are printed in Labbe's *Concilia*, vol. x. III. LORARIO COSTI, born in or near Rome about 1161, elected Jan. 8, 1198, died in Perugia, July 16, 1216. Being from his childhood destined for the church, he was sent to Paris to study theology, and then to the university of Bologna, where he mastered the science of law. He returned to Rome in 1181, and, after passing through the lower ecclesiastical ranks, was in 1190 made cardinal deacon by his uncle, Pope Clement III. Being coldly treated by Celestine III., Clement's successor, he retired to Anagni, where he composed his treatise *De Contemptu Mundi, sive de Miseriis Humanæ Conditionis*. On the day that Celestine died, although but 37 years old, he was unanimously chosen his successor by the college of cardinals. He reluctantly accepted the tiara; but as soon as he was firmly seated on his throne, he showed himself a worthy successor of Gregory VII. Aiming, like his great prototype, at establishing the supremacy of papal power, he soon made his influence felt in nearly every part of Christendom. His first care was to restore order in the administration of the city of Rome, by forcing into submission such civil officers as had hitherto sworn allegiance to the emperor; he then extended his authority over the cities of central Italy which had been usurped by vassals of the empire, and, while vindicating his political rights, appeared as the champion of justice, humanity, and morality. Philip Augustus of France having repudiated his wife Ingelburga of Denmark to marry Agnes of Meran, Innocent excommunicated him in 1199, and put his kingdom under an interdict. After resisting for 8 months, the king finally yielded to the pontifical authority, dismissed his new queen, and took back the Danish princess. Innocent had previously been instrumental in bringing about a 5 years' truce between Philip Augustus and Richard I. of England. About the same time he was appointed to the guardianship of young Frederic Hohenstaufen, the son of the late emperor Henry VI., and of Constanza, queen of Naples and Sicily. He was soon called to

interfere in the political affairs of Germany. Philip of Swabia and Otho of Brunswick were now contending for the imperial crown. Innocent, after trying in vain to bring about a pacification between the two rivals, took the part of the latter, who nevertheless was unable to stand his ground, and was obliged to take refuge in England. Meanwhile the pope had increased his power in Italy, and concluded with the cities of Lombardy an alliance against Philip of Swabia, by which he was enabled to reappear as a mediator: he proposed a compromise, leaving Philip in the undisputed possession of the imperial crown, and declaring Otho his successor. This agreement had scarcely been entered into when the emperor was murdered by one of his followers. Otho was immediately acknowledged by most of the German princes, and proceeded to Rome, where he received the imperial crown at the hands of the pope, Oct. 4, 1209. But the new emperor soon showed signs of opposition to the power of the pope, seized upon several cities of central Italy, and claimed Naples and Sicily as fiefs of the empire. Innocent at once excommunicated him, called for the assistance of France, and summoned the electors to choose another emperor. They obeyed the summons, deposed Otho in 1212, and elected in his room the pope's ward, Frederic, king of Naples and Sicily. Innocent acted also a conspicuous part in the events which marked the latter part of King John's reign in England. The election of Stephen Langton to the archbishopric of Canterbury, supported by the pope and opposed by the king, was the cause of a protracted dispute, in the course of which John, resorting to violent and even cruel measures, saw his kingdom placed under an interdict, and himself excommunicated, and finally deposed by the pope in 1213, Philip Augustus being directed to put the sentence into execution. John, frightened into submission, complied with the humiliating terms which were dictated to him by the pope's legate, and put his dominions under the protection of the Roman see. Innocent immediately commanded the king of France to desist from the attack upon England, which belonged to the church; thenceforth taking up the cause of his vassal, he supported him in his contest against his revolted subjects and the attacks of Louis of France, the son of Philip Augustus, but could not prevent his being driven out of England. Innocent showed also his ecclesiastical zeal by causing the 4th crusade, A.D. 1202-'4, to be preached in the principal states of Europe. He displayed the most uncompromising severity against heresy, the extirpation of which was with him a matter at once of duty and policy; this led him to sanction the crusade against the Albigenses, which was carried on by his legates and Simon de Montfort with such rigor and cruelty as to finally draw his censure upon them. After being for 18 years the ruling spirit of his age, he was carried off by a violent fever which terminated in paralysis. Innocent's works, published at Cologne in 1552 and 1575

and at Venice in 1578, consist of theological discourses, homilies, and a commentary upon the 7 penitential psalms, and a number of letters. His letters, which are the most important in a historical point of view, were printed by Baluze in 2 vols. fol. (Paris, 1682), to which Bréguigny and Du Theil in 1791 added 2 other vols. containing new letters collected from the Vatican archives. Innocent is the author of a celebrated hymn, *Veni Sancte Spiritus*. The *Stabat Mater*, which is also attributed to him, is claimed as the work of a Franciscan. The German historian, F. Hurter, has published a remarkable history of this pope: *Geschichte Pabst Innocenz III. und seiner Zeitgenossen* (4 vols. 8vo., Hamburg and Gotha, 1834-'42). IV. INNOCENT XI., BENEDETTO ONESCALCHI, successor of Clement X., born in Como in 1611, elected Sept. 10, 1676, died Aug. 21, 1689. He was the son of a rich merchant, and served as a soldier; but on being severely wounded, he repaired to Rome, where he took orders. He was promoted to a cardinalship by Innocent X. His virtues and talents secured him general esteem; and on his accession to the papal throne, he applied himself to revive the ancient discipline of the church. He attempted to curtail the right of asylum, which, being possessed by foreign ambassadors, had extended to the entire districts where their residence was situated. His good intentions were partly baffled by the opposition of Marshal d'Estrées, the French ambassador; but he was prudent enough to avoid at the time an open rupture with Louis XIV. The domineering spirit of the king soon gave rise to a quarrel. In 1673 a decree of Louis ordered the *regale*, that is, the royal privilege of receiving the revenues and granting at pleasure the benefices of vacant bishoprics, to be extended over the provinces of France in which it had not yet been in existence; this was opposed by the bishops of Alet and Pamiers, whom the pope earnestly supported. The king then summoned a general assembly of the bishops of his kingdom, who not only supported his policy concerning the *regale*, but issued the 4 celebrated propositions of March 16, 1682, declaring the power of the pope inferior to that of a general council, and maintaining the special rights and privileges of the Gallican church. In answer to this, Innocent held a solemn consistory, severely censured the bishops who had taken part in the proceedings, which a bull declared null and void, ordered the 4 propositions to be burned, and refused to grant canonical confirmation to such bishops as had been newly appointed by the king. This contest was embittered by the renewal of the quarrel about the right of asylum. By a brief of May 12, 1687, Innocent formally abolished that right, and excommunicated all who should maintain it. Louis XIV. at once gave orders to his new ambassador, the marquis de Lavardin, to uphold the disputed privilege, even by force; and the marquis accordingly made a solemn and threatening entrance into Rome at the head of about 800 armed men. The pope, considering him

excommunicated *de facto*, declined receiving him, and ordered worship to be discontinued wherever he should present himself. The king, exasperated at the pope's firmness, caused his parliament and a number of French bishops to appeal to a general council against Innocent's measures, had his nuncio arrested in Paris, and seized upon Avignon. The pope continued inflexible to the last. It was during his pontificate that Michael Molinos, a Spanish priest, advanced in his "Spiritual Guide" the mystical doctrine known as quietism. Innocent, yielding to numerous complaints, gave him up to the inquisition, and sanctioned his condemnation by a bull. The Jesuits had previously charged the pope with being a Jansenist. He was succeeded by Alexander VIII.

INNS OF COURT, colleges in London, in which students of law reside and pursue their studies. In England at a very early date the science of law was taught in the metropolis in certain buildings situated in the immediate vicinity of the courts of law and called inns of court, inn anciently signifying a mansion or place. The establishment of the court of common pleas at Westminster led to the gathering in its neighborhood of the whole body of "common" lawyers, and to the establishment in the metropolis of hostels or *hospitia curie*, which were so called because they were attached to or dependent upon the court. These hostels were occupied by the lawyers as offices and sometimes as dwellings, and contained also schools where the law was studied. But in 1346 the knights hospitallers of St. John of Jerusalem, to whom the pope had granted the English estates of the suppressed order of knights templars, leased the buildings and gardens of the templars in London to certain students of the common law, who established in them a hostel or inn of court. The place continued to be called the Temple, from its former occupants. In the course of a few years the number of inns increased to 4, which still exist, viz.: the Inner Temple, the Middle Temple, Lincoln's Inn, and Gray's Inn, each of which contained 200 members. Stow, in his "Survey of London," published in 1598, says of the lawyers who occupied these inns: "These societies are no corporations, nor have any judicial power over their members, but have certain orders among themselves which by consent have the force of laws. For slight offences they are only excommunicated, that is, put out of commons, which is, not to eat with the rest in their halls; and for greater, they lose their chambers, and are expelled the house; and being once expelled, they are not to be admitted by any of the other 3 societies. The gentlemen in these societies may be divided into 4 ranks: 1, benchers; 2, utter benchers; 3, inner barristers; 4, students." In course of time two bodies were formed, called the "Honorable Society of the Inner Temple" and the "Honorable Society of the Middle Temple," who held their buildings as tenants of the knights hospitallers until the suppression of monastic bodies by Henry VIII.,

after which they held them of the crown by lease. In 1608 the buildings of the two temples were granted by letters patent of James I. to the chancellor of the exchequer, the recorder of London, and the benchers and treasurers of the Inner and Middle Temples, their heirs and assigns for ever, to have and to hold, for "lodging, reception, and education of the professors and students of the laws;" and it is by virtue of these grants that they are still held by an incorporated society of the "students and practisers of the laws of England." The Temple garden, which lies between Whitefriars and Essex street, has been celebrated by Charles Lamb and Leigh Hunt, and was much frequented as a pleasure walk during the 17th and 18th centuries. Shakespeare, in the first part of "King Henry the Sixth," makes it the scene of the origin of the factions of York and Lancaster. At the close of the 18th century it was the fashion for the leading lawyers to promenade in the Temple garden, toward evening, in fine weather. In the hall of the Inner Temple, a noble room ornamented with emblematical paintings by Sir James Thornhill, and by portraits of Littleton and Coke, dinner is prepared for the members of the inn every day during term time. Students of law must keep 12 terms, that is, 5 years, at the inns of court before they are entitled to be called to the bar, and those of the Inner Temple are required to dine in this hall at least 4 times in each term. On certain "grand days" the judges, the masters in chancery, and many of the leading lawyers of England dine here, together with a large assemblage of the students. Formerly the Inner Temple was celebrated for the magnificence of its entertainments and revels, especially in the 16th and 17th centuries. The hall of the Middle Temple, the largest and finest of the old inns of court, was built in 1562-'72. It is ornamented by elaborate carvings, by portraits and busts, and by the coats of arms of Somers, Hardwicke, Cowper, Thurlow, Dunning, Eldon, Blackstone, Stowell, Teunterden, Curran, and many other eminent lawyers, formerly members of the society, emblazoned on its windows. Lincoln's Inn, the next in importance to the Inner and Middle Temples, is situated on the W. side of Chancery lane, and derives its name from being on the site of the palace of an earl of Lincoln who died there in 1310, and by whom the land was assigned to certain professors of the law for the establishment of an inn of court. The hall and library, designed by Hardwick, and finished in 1845, form one of the noblest piles of building in London. The chambers of this inn are chiefly occupied by chancery barristers, conveyancers, and persons in attendance on the court of chancery, which court is held in its hall. Attached to the inn are extensive gardens, celebrated in the "Tatler," No. 100. Gray's Inn, the 4th inn of court in importance and size, is named from the lords Gray of Wilton, whose residence it originally was. It is situated on Gray's Inn lane, and has a garden

which appears to have been planted with elm trees in 1600 under the direction of Francis Bacon, at that time treasurer of the society. The hall is a very handsome room, built in 1560. Its windows are emblazoned with the armorial bearings of Lord Bacon, Sir Nicholas Bacon, Lord Burleigh, and other eminent members.—Each of the inns of court forms an independent corporation, but they all agree in the observance of certain common regulations. No person can keep a term in any of them without being in the hall on 3 days when the grace is said after dinner. None of the societies can call a gentleman to the bar before he has been 5 years a member of the society, unless he is a master of arts or a bachelor of laws of the university of Oxford, Cambridge, or Dublin. No person in trade or in deacon's orders, and no one who has held the situation of a conveyancer's clerk, can be admitted at all; and solicitors and attorneys must have their names struck off the rolls for two years, and the articles of clerks must be expired or cancelled two years, before they can be admitted. An applicant rejected by one society will not be admitted by any other. On his admission the student pays for various fees from £30 to £40, and enters into a bond of £100 for the payment of his commons or dinners while a student. On the expiration of his terms he addresses a petition to the benchers at a special council; and if they approve, he waits upon them after dinner, the oaths are administered, and he is called to the bar. His dues for admission vary in the different inns from £66 in Gray's Inn to £93 in Lincoln's Inn. There are different degrees among the members of the inns. The sergeants are the highest degree at common law, as the doctors are in civil law. Queen's counsel is another rank, admission to which is technically called giving a silk gown, the costume of the bearers of this honor. The benchers of the inns are elected from the barristers at the bar according to seniority. They govern the society, and may reject an application for admission without assigning a reason. In Lincoln's Inn about 100 gentlemen are admitted members of the society every year, about half of whom are called to the bar.—The 4 great inns of court have attached to them inns of chancery, of which the Inner Temple has three, Clement's, Clifford's, and Lyon's; the Middle Temple one, New Inn; Lincoln's Inn two, Thavies's and Furnival's; and Gray's Inn two, Barnard's and Staples's. These inns are principally inhabited by attorneys.

INNSBRUCK, or INNSBRUCK, capital of the Tyrol, picturesquely situated on both sides of the Inn near its junction with the Sill, surrounded by steep mountains varying from 6,000 to 8,000 feet high, at a distance of 245 m. from Vienna, and taking its name from the wooden bridge that spans the river (*Innsbrücke*); pop. about 15,000. The town is well built, especially on the right bank of the Inn. The finest street is the Neustätterstrasse, with the building where the Tyrolese estates hold their sittings, the post

office, and a triumphal arch erected by Maria Theresa. The Franciscan church or *Hofkirche* contains one of the most splendid monuments of Europe, that of Maximilian I. (who however is not buried there, but in Neustadt near Vienna). The monument consists of 28 bronze statues of eminent persons. In the same church is the Silver Lady chapel, so called after a silver statue of the Virgin, containing the mausoleums of the archduke Ferdinand and of his wife Philippine, which are attributed to the genius of Colin, whose own tomb, said to be the work of his own hands, is in the cemetery of Innsbruck. The tomb of Andreas Hofer is in this chapel. It was in this church that Christina of Sweden made her public renunciation of Lutheranism. There are altogether 11 churches, among which is the Capuchin church with the penitential cell of Maximilian II., and the St. James church, noticeable for its rich decorations. Among the other public buildings are the palace built for Maria Theresa, with an equestrian statue of Leopold V. in the court yard; and a large edifice in the city square (*Stadtplatz*), once the residence of the counts of Tyrol, now a private dwelling, with a famous golden roof (*das goldene Dachl*), built in the 15th century, at a cost of 30,000 ducats. The chief educational establishment is the Roman Catholic university, with about 25 professors and 350 students. The principal manufactures of the town are silks, ribbons, gloves, calico, glass, &c. Innsbruck was called by the ancients *Enipontum*, as marking a spot where the Inn was crossed by armies. In the middle of the 13th century it was clothed with the privileges of a town by Otho I., duke of Meran. It subsequently became the residence of the Austrian archdukes, and its most prosperous period was in the 17th century, when Ferdinand II. held his brilliant court there. In 1703 it was taken by the Bavarians, but soon recovered by the Austrians. In 1809 it suffered much during the war in the Tyrol. After the 2d revolutionary outbreak in Vienna in 1848, the emperor Ferdinand fled to Innsbruck, and resided there for several months.

INO, in Greek mythology, a daughter of Cadmus and Harmonia. By command of Juno, Athamas, king of Orchomenus, had married Nephele, by whom he was father of Phrixus and Helle; but he was also secretly wedded to Ino, by whom he had Learchus and Melicertes. Hating the children of her rival, Ino induced her husband to believe that the gods were angry with him, and could only be appeased by the sacrifice of Phrixus and Helle. The murder would have taken place, but Nephele rescued the children. Mercury now punished Ino by giving her the young Bacchus to nurse, which brought down on her and her husband the anger of Juno. Athamas was driven mad, and in this state killed his son Learchus; while Ino, flying for safety with Melicertes in her arms, leaped into the sea. Neptune changed her into a sea goddess, giving her the name of Leucothea, while Melicertes became Palaemon.

INQUISITION, or HOLY OFFICE, a tribunal, established in several Roman Catholic countries, to search out and to try heretics, as well as persons charged with certain other offences against morality or the canons of the church. The first formal sanction of the inquisition by a papal bull was in the 13th century, but long before that heresy had been declared a crime, and inquisitors, or inquirers after heretics, had been appointed by Christian princes. The first emperor who made Christianity a state religion, Constantine the Great, repeatedly banished those who refused submission to his decisions in doctrinal controversies. Athanasius, the defender of orthodoxy, and Arius, shared in turn the same fate. The same policy was pursued by the sons of Constantine. Theodosius I. in 382 appointed the first inquisitors for the punishment of Manicheans, who even long before had been treated as criminals deserving the severest penalties. A law of Honorius in 398 threatened the professors of certain heresies, in particular the priests of the Montanists and Eunomians, if they persisted in bringing people together, with banishment and death. The decrees for the extermination of heathenism were even more severe. Heathen sacrifices were forbidden by Constantius in 353 under pain of death. Theodosius I. in 392 proclaimed every form of idolatry a crime, and every attempt to learn the secrets of the future by animal sacrifices high treason. Theodosius II. remitted capital punishment in 423, but again enforced the law against heathen sacrifices in 426. Most of the earlier fathers were opposed to the punishment of heretics by the secular arm, and particularly to the infliction of death. Chrysostom and Augustine approved of their being confined or exiled, but only Jerome and Leo the Great were in favor of the death penalty. The first instance in which the blood of a heretic was shed by the solemn forms of law occurred in 385, when Priscillian, the leader of a Gnostic sect in Spain, was put to death by the sword, at the instigation of Bishop Itacius. The church was struck with horror at the act; Itacius was excommunicated and died in exile. Justinian, in his code, provided certain penalties for dissenters from the orthodox creed as expounded by the "four holy synods" of Nice, Constantinople, Ephesus, and Chalcedon; and from this code the future legislation against heretics was derived. For several centuries, all cases of heresy came before the ordinary courts; but in the course of time the examination of the charge of heresy devolved upon bishops, who handed over those who remained obdurate to the secular courts for punishment. Sometimes, however, ecclesiastical councils specified the punishment to be inflicted on certain classes of heretics. The organization and development of the synodal courts in the 8th and 9th centuries systematized also the proceedings against heretics. The spreading of the views of the Catharists, Waldenses, and Albigenses in the 11th and 12th centuries, and the dangers accruing therefrom to the Catholic church, induced

the popes to devise more stringent means for the extermination of heresies. At the beginning of the 13th century, Innocent III. sent several Cistercian monks as his legates to the south of France, in order to force the great feudatories of Provence and Narbonne into a war against the Albigenses, and to assist the bishops in searching out the heretics and in giving them over to punishment. The 4th council of Lateran in 1215 enjoined upon the synodal courts the searching out of heresy and its suppression as a duty, and may therefore be regarded as having permanently established inquisitorial courts. The bishops were called upon either to visit personally or to send delegates into every parish suspected of being infected with heresy, and to cause several, or if necessary all of the inhabitants to swear that they would inform against all heretics as well as those attending secret meetings; all who refused to take this oath should be suspected of heresy themselves. These arrangements were confirmed and enlarged by the synod of Toulouse (1229), which issued on this point 45 propositions, among which were the following: "Any prince, lord, bishop, or judge, who shall spare a heretic, shall forfeit his lands, property, or office; and every house in which a heretic is found shall be destroyed. Heretics or persons suspected of heresy shall not be allowed the assistance of a physician, or of any of their associates in crime, even though they may be suffering under a mortal disease. Sincere penitents shall be removed from the neighborhood in which they reside, if it is suspected of heresy; they shall wear a peculiar dress, and forfeit all public privileges until they receive a papal dispensation. Penitents who have recanted through fear shall be placed in confinement." The synod also enjoined upon the bishops to bind in every parish a priest and 2, 3, or more laymen by oath to search out heretics. As however many bishops were accused of being either remiss or partial, Gregory IX. transferred the inquisition to the Dominicans, first in Germany and Aragon, then also in Lombardy and southern France. To aid the inquisitors in the exercise of their office, a new order was founded called the *militia Jesu Christi contra hæreticos*. The church, however, contented itself with the examination of the heretics, and called on the secular arm to carry the sentences into execution. Louis IX. of France from attachment to the church, and Raymond VII. of Toulouse and Frederic II. of Germany in order to escape the suspicion of heresy, complied with this request, and made the execution of the sentences passed by the inquisitors obligatory. The procedure of the inquisitors differed in many points from that of the civil courts. In accordance with a decree of the councils of Beziers and Narbonne in 1235, confirmed by Innocent IV. in 1254, the informers were never named to the accused; suspicion of heresy was considered a sufficient cause of arrest; accomplices and criminals were admitted as witnesses. If the accused denied the

charges, he might be put to the torture to obtain his confession. The regulations of the earlier inquisitions are found in the *Directorium Inquisitorium* of Nicholas Eymeric, who for 42 years held the office of chief inquisitor in Aragon, and died in 1399. It was first published at Barcelona in 1503; again at Rome, with a commentary by Pegna, in 1578; and has often been reprinted. The power of the inquisition was greatly increased by the income which it derived from the property of the condemned. Innocent IV. in 1252 assigned to it one third of such property, and ordered one third to be reserved for future uses; in the 15th century it was common for the inquisitors to claim the entire property. The people in the south of France rose repeatedly in rebellion, and took bloody vengeance on some of the inquisitors, as at Toulouse in 1245. The parliaments declared themselves against its proceedings as irregular and unprecedented, and several kings, as Philip IV. and Louis XI., limited its jurisdiction. Still more was its influence weakened by the schism of the 14th and the reformatory councils of the 15th century. After the reformation of the 16th century, Henry II., urged by Pope Paul IV., made an attempt to reestablish it, and even extorted the consent of the parliament to an edict of this kind; but it never again gained strength, was wholly abolished by Henry IV., and has not been reintroduced.—In Spain the inquisition was introduced soon after its establishment in France. The Aragonese branch can be traced by authentic records as far back as the year 1232, and in the course of this century courts were established in the dioceses of Tarragona, Barcelona, Urgel, Lerida, and Gerona. At first it passed no sentence more severe than confiscation of property, and even this was restored if the accused abjured his opinions within a term called the "period of grace." Toward the close of the 15th century a new impulse was given to it by Cardinal Pedro Gonzalez de Mendoza, archbishop of Seville, and in time it assumed gigantic dimensions, becoming more absolute and independent than in any other state of Europe. The probability of a union between the Jews and Moors against the Christians at that time excited in Spain considerable alarm. The Jews formed a large proportion of the population, and held enormous wealth. Severe restrictive measures were passed against them by the civil authorities from time to time, and finally about 1477 certain of the clergy proposed to Ferdinand to establish the inquisition in Castile with the primary object of searching out those who having been converted to Christianity had relapsed into Judaism, or who feigned conversion while secretly attached to the faith of their fathers. The king readily assented, and, the consent of Isabella having been reluctantly given, a papal bull was procured in 1478 authorizing the establishment of the tribunal. Thus the Spanish inquisition was from its beginning more a royal than a merely ecclesiastical court. In 1480 two

Dominicans were appointed the first inquisitors, and the first court was established at Seville. They issued their first edict on Jan. 2, 1481, by which they ordered the arrest of several "new Christians," as converts were popularly called, who were suspected of heresy, and on Jan. 6 the first *auto de fe* was held, when 6 persons were burned alive. Executions soon became frequent. Several of those who had been condemned as contumacious appealed to Pope Sixtus IV., who, in Jan. 1482, complained of the conduct of the two inquisitors, and recommended mildness and moderation. Soon after he appointed the archbishop of Seville apostolic judge of appeal for all Spain, with power to decide on all appeals from the judgments of the inquisition. In 1483 Torquemada became grand inquisitor-general of all Spain, and at the same time Ferdinand appointed a royal council of the supreme inquisition (*consejo de la suprema inquisicion*), of which the grand inquisitor was president of right and for life, with a bishop and two doctors at law as counsellors. Torquemada in concert with the king framed the organic laws of the new tribunal, styled instructions, which consisted of 28 articles, and were promulgated at Seville in 1484. Additions were made to them in 1488 and 1498, and at last a new compilation of regulations, consisting of 81 articles, was made by the inquisitor-general Valdez in 1561, which remained ever afterward the guide of Spanish inquisitors. All the penitents of the inquisition wore a peculiar habit, called *san benito* (a corruption of *saco bendito*, "the blessed vest" of penitence), of which there were 3 different kinds for the 3 classes of condemned, and an equal number for those who were doomed to suffer death. By its compact organization the inquisition soon became very powerful. The inquisitor-general was appointed by the king and the pope jointly. He named the subaltern officers, and had an absolute control over all the lower courts. The expulsion of the Jews (1492) and the Moors (1501) from Spain, from which many tried to escape by conversion to Christianity, and later the spreading of Protestantism, furnished the inquisition with abundant occupation. According to the estimate of Llorente, whose accuracy, however, has been called in question by Catholic writers, the number of those burned alive under Torquemada (1483-'98) amounted to 8,800, those under Deza (1499-1506) to 1,664, and those under Cardinal Ximenes (1507-'17) to 2,536. The general result of his statements for the time from 1483 to 1808 is as follows: burned alive, 31,912; burned in effigy, 17,659; subjected to rigorous pains and penances, 291,450. From the beginning of the 17th century, when it had succeeded in completely exterminating Protestantism in Spain, the inquisition became more lenient, and directed its efforts mostly to the suppression of heretical books. In the 18th century the *autos de fe* became very rare. Charles III. and his minister, Count Aranda, greatly restricted its jurisdiction, and Joseph Bonaparte

entirely abolished it in Dec. 1808. It was restored by Ferdinand VII. in 1814, but again abolished by the constitution of the cortes in 1820. After the restoration an inquisitorial junta reappeared in 1825, and in 1826 a tribunal was reestablished at Valencia. In 1834 it was again abolished, and in 1835 its property was confiscated for the payment of the public debt. Public opinion in Spain is at present so generally opposed to it, that no public organ advocates its restoration. The most complete work on the Spanish inquisition is by Llorente, "Critical History of the Spanish Inquisition," translated into French by A. Pellier (4 vols. fol., Paris, 1817). An abridged English translation was published in London in 1826, and reprinted in Philadelphia. The author declares that he was secretary of the inquisition of Madrid during the years 1789-'91; that from 1809 to 1811 all the archives of the inquisition were placed at his disposal; and that he burned, with the approbation of Joseph Bonaparte, all the criminal processes except those which from their importance and the rank of the accused belonged to history. The accuracy of some of his statements is greatly doubted by many. The best work on the Spanish inquisition written from a Catholic standpoint is C. J. Hefele's *Der Cardinal Ximenes* (Tübingen, 1844).—An attempt to establish the Spanish inquisition in Naples was made by the Spanish viceroy in 1546; but the Neapolitans, by energetic resistance, prevented it. The towns of Lombardy successfully remonstrated against a similar attempt of Philip II., but it was introduced into Sicily and the Spanish colonies in America. In the latter the tribunals of Mexico, Cartagena, and Lima rivalled in severity those of Spain. Charles V. sent it to the Netherlands, where it greatly increased the discontent of the people with the Spanish dominion; and the attempt of Philip II. to reestablish it was among the principal causes which led to the revolt of the 7 northern provinces and the rise of the Dutch republic. The inquisition was not introduced into Portugal till 1557. Its organization was nearly the same as in Spain. The supreme court of inquisition, to which all other courts of the kingdom were subordinate, had its seat at Lisbon; the grand inquisitor was appointed by the king and confirmed by the pope. John IV., after delivering Portugal from the Spanish rule (1640), intended to suppress the inquisition, but succeeded only in mitigating it. Its power was broken by King Joseph (died 1777) and his minister Pombal. John VI. (died 1826) abolished it both in Portugal and in its dependencies, Brazil and Goa.—In Italy the inquisition never became as powerful as in France and Spain. It was introduced in 1233 against the Waldenses, and the chronicles of many Lombard towns mention the burning of heretics; but their number seems to have been less considerable than in France and Spain. A celebrated inquisitor, Pietro di Verona, who exercised his office with great severity during 19 years, was

slain in 1252. In the 16th century, courts for the suppression of Protestant doctrines were established in Tuscany, Venice, Milan, Parma, and other states; but their sentences remained subject to the sanction of the temporal sovereign. A supreme tribunal of the inquisition for the whole church, called the congregation of the holy office, and consisting of 6 cardinals, was established by Paul III. at Rome, in 1543, but beyond the limits of the Papal States the authority with which the pope invested it was never conceded to it by the temporal sovereigns. Sixtus V. in 1588 changed the name of the congregation to that of the holy Roman and universal inquisition, and made it to consist of 12 cardinals, with several assessors, consultors, and qualifiers (who had to prepare the cases). The Roman inquisition was the mildest of all tribunals of this nature, no instance having occurred of the punishment of death being inflicted through its agency. Napoleon abolished the inquisition in all Italy in 1808. It was reintroduced in the Papal States by Pius VII. in 1814, in Tuscany and Sardinia in 1833. In the Papal States it still exists in the form which Sixtus V. gave to it, but the legations, after declaring their independence of the papal dominion, abolished also the offices of provincial inquisitors at Bologna and Ferrara in 1859. In the same year it was abolished in Tuscany. In Sardinia it was stripped of all power in 1848.—Outside of the territory of the Romanic nations the inquisition never gained a firm footing. In Germany it was established as early as 1231, but the severity of the first inquisitor, Conrad of Marburg, aroused so general and violent an indignation, that he himself was slain in 1233, and Germany remained for a long time without inquisitorial courts. An attempt to revive it was made in the 14th century in consequence of the appearance of the Beguins. Charles IV. in 1369 supported the inquisitors by 3 edicts. Pope Gregory XI. in 1372 appointed for Germany 5 inquisitors, and Boniface IX. in 1399 increased their number for northern Germany alone to 6. In 1484 it was greatly extended for the purpose of ridding Germany of sorcerers and witches, but the reformation destroyed its power even in those portions of Germany which remained Catholic. Though attempts were made to restore it in Austria and Bavaria (1599), it never regained any considerable power, and since its abolition by Maria Theresa no trace of it has existed in Germany. In England, Sweden, Norway, and Denmark it was never permanently established; and in Poland, where Pope John XXII. introduced it in 1327, it was of but short duration.—Though the inquisition, under this name, was an institution peculiar to Roman Catholic countries, the principle which lies at the bottom of it, that heresy, or dissent from the established church, is to be punished as a crime, had a sway far more extensive. The Jews, Mohammedans, and heathens recognized generally this principle. The Greek church in Russia, Turkey, and Greece

is generally in favor of maintaining the prerogatives conferred by the state, and Protestant Sweden in 1858 banished 6 women for having joined the Roman Catholic church. A general history of the inquisition, critical and impartial, is still wanting. A critical survey of a number of works, treating on the subject, appeared in the "British Critic" in 1827, and was reprinted in the Philadelphia "Museum of Foreign Literature and Science" in the same year.

INSANITY (Lat. *insanitas*, from *in*, privative, and *sanus*, sound, healthy), in general terms, an unsound or diseased condition of the mind. Many attempts have been made to define insanity, but with very problematical success; the phenomena are so numerous and varied that it seems impossible to include them all under one head, and at the same time to exclude other and different diseases. Locke's notion that delusion, illusion, or hallucination is necessary to insanity, excludes a large class of cases in which neither of these sources of error may be present. The definition of Cullen, "a lesion of the intellectual faculties, without pyrexia and without coma," errs in the same way; for often the purely intellectual faculties are comparatively sound. Perhaps Dr. Bucknill's definition ("Unsoundness of Mind in Relation to Criminal Acts"), "a condition of the mind in which a false conception or judgment, a defective power of the will, or an uncontrollable violence of the emotions and instincts, have separately or conjointly been produced by disease," though somewhat awkward, comes sufficiently near the truth. Equal difficulty attends the classification of the various forms of mental disease, and must continue to exist until our knowledge of the philosophy of the mind and of the functions of the various parts of the organ which subserves its manifestations is much more advanced than at present. In the absence of any basis on which a philosophical classification can be founded, we can only adopt one under which the phenomena can be most conveniently arranged. Tuke and Bucknill ("Manual of Psychological Medicine"), whose classification we shall follow with slight modifications, treat of insanity under the following heads: 1, delusional insanity, of a melancholy, of an exalted, and of a destructive character; 2, emotional insanity, divided into melancholia without delusion, mania with general extravagance of conduct (moral insanity), and mania with disposition to homicide, to theft, &c.; 3, mania; 4, dementia; 5, idiocy.—In delusional insanity, the patient is harassed with hallucinations, illusions, or delusions. By psychological writers these words are used in definite significations. In hallucination, sensations are perceived without any object to excite them being present; the patient sees persons, hears voices, smells odors, though neither persons, voices, nor odors have any real existence. Illusion exists where there is a false perception of a real object. Delusion consists in a false belief which is not the result of a false process of reasoning; a man who believes

that he is made of glass, that he has lost his soul, or that he is Mohammed, is laboring under a delusion. Hallucination and illusion can exist without insanity, since by the use of reason a man may be able to correct his false sensations; but delusion cannot be present while the mind is perfect. Among the insane, hallucinations of hearing are the most frequent; patients hear voices of approval or condemnation, they are directed to perform particular acts, to commit suicide, murder, &c. The poet Cowper suffered from hallucination of this kind. Next in frequency to hearing, vision is subject to hallucination; the lunatic sees visions, is sensible of an exceeding bright light, is tormented by the sight of hideous and repulsive animals, or is amused by the antics and vagaries of others. Smell, touch, and taste are much less subject to hallucination than vision and hearing. Many of the sensations felt by the insane in the internal organs, having no objective existence, must be regarded as hallucinations. Hallucinations alone do not constitute insanity, for the mind must be affected before they can be believed, nor are they confined to any one variety of insanity. Esquirol states that 80 out of every 100 insane patients are subject to them. M. Brierre de Boismont states that in his asylum, out of 62 patients, hallucinations were present in 38 and absent in 24. At the Bicêtre, of 21 patients admitted during one year affected with melancholia, 11 had hallucinations, 6 being of hearing, 3 of sight, and 2 of taste; while of 181 maniacs, 54 only were ascertained to be subject to hallucination, in 23 of whom hearing was affected, in 21 sight, in 5 taste, in 2 touch, in 1 smell, and in 2 cases the sensations were internal. Hallucinations may become epidemic, particularly when occurring from superstition. They are often among the earlier symptoms of insanity, and are dangerous according to their character. One may see ecstatic visions or hear voices proclaiming his salvation, and be left at large with perfect safety; while if voices are heard counselling self-destruction or the injury or murder of others, the hearer should be immediately confined. Of delusion the annals of witchcraft and the strange stories of lycanthropia or wolf madness, once not uncommon on the continent of Europe, afford melancholy examples. Like hallucinations, delusions are met with in most of the forms of insanity. In every asylum of the insane, and sometimes among those who in other respects reason well and acutely, we meet with those who are in possession of imaginary wealth and titles, or who are suffering under some hopeless and terrible infliction.—Melancholia was formerly used to signify a partial insanity, whether of a painful or pleasurable nature; but it is now commonly confined to cases in which the patient is given over to a sad and hopeless despondency. It may be sudden, as when caused by grief or (though this is rare) it may come on gradually without any external cause, or it may appear as the sequel of mania. "The chief propensities manifested," says Dr. Conolly, "are

to indolence and general indifference; they read nothing, write to nobody, shun all exertion; remarking keenly on their own altered state: 'Once I was industrious, now I am idle and worthless; the world does not seem as it did to me; every thing good seems to have gone out of me.'" "Sometimes," observe Tuke and Bucknill, "melancholy assumes a passive attitude; the arms hang loose at the side, the hands are open, and the muscular system is relaxed altogether; at other times grief intensifies the action of the muscles; the patient's arms are rigidly flexed; the hands clasped and pressed against his chest, or he wrings them in all the bitterness of despair." The physical derangement of the system presents nothing peculiar; the digestive organs are commonly deranged, the tongue loaded, the bowels constipated. In women the uterine functions are apt to be disordered; a sensation of sinking and weight at the epigastrium is often complained of, and sometimes headache is present. The disease may be uncomplicated with any derangement of the intellect, and then forms one of the varieties of the "moral insanity" of Dr. Prichard. Nostalgia (Gr. *nostos*, return, and *algos*, sadness), or home sickness, is a form of simple melancholia. As is well known, it affects those brought up in the country rather than the natives of cities, the inhabitants of mountains rather than those of plains. But in melancholia the disease is accompanied in the greater number of cases by more or less unsoundness of intellect. The patient suffers from hallucinations, or he has some fixed delusion; thus in religious melancholy he believes he has committed the sin against the Holy Ghost, or that he is doomed to eternal perdition. When the disease is uncomplicated with derangement of the intellect, the majority recover; but when the intellect is affected, the disease is looked upon as less curable than mania. As it advances, organic change often supervenes in the abdominal or thoracic viscera, and carries off the patient. Sometimes he lapses into hopeless dementia. Included by some authors under the same head, but formed by Esquirol into a separate order under the class of monomania, is an affection characterized by phenomena totally differing in their appearance from those of melancholia. The delusions entertained by patients of this class are gratifying to their vanity or pride; they are wealthy, high-born, powerful. "Among monomaniacs," says Esquirol, "the passions are gay and expansive; enjoying a sense of perfect health, of augmented muscular power, and of general well being, this class of patients seize upon the cheerful side of every thing; satisfied with themselves, they are content with others. They are happy, joyous, and communicative; they sing, laugh, and dance. Controlled by vanity and self-love, they delight in their own vain-glorious convictions, in their thoughts of grandeur, power, and wealth. They are active, petulant, inexhaustible in their loquacity, and speaking constantly of their felicity. They are

insusceptible and irritable; their impressions are vivid, their affections energetic, their determinations violent; disliking opposition and restraint, they easily become angry and even furious." Sometimes this kind of insanity assumes the form of religious excitement. The patient regards himself as peculiarly favored by the Deity, perhaps as the recipient of direct inspiration; and occasionally such conviction is impressed upon the mind of one suffering under religious melancholy, and then the patient passes at once from the depths of despair to one of triumphant and ecstatic happiness. Apart from other forms of mental alienation, this variety of emotional insanity is very rare.—Under the head of emotional insanity may be mentioned a subject which of late years has given rise to a great deal of discussion, viz.: moral insanity, alienation or perversion of the moral faculties, dependent upon physical causes, and unaccompanied by any marked perversion of the intellect. It is admitted on all hands that the brain is the organ of the mind; that when the brain is diseased the intellect may be destroyed or perverted. But the brain is equally the organ of the moral affections; these are commonly affected in intellectual derangement, but not necessarily nor constantly; is the converse true, and, through disease of a part of the brain, can the moral affections be perverted without any marked perversion of the intellect? A person naturally kindly and affectionate becomes gradually, and without perceptible cause, peevish, morose, and suspicious. He now suddenly, and still without adequate cause, commits some act of violence, perhaps a homicide. Was not the man insane? Again, as there are those who from the constitution of the brain are born idiots, are there not others who from a similar constitution are moral idiots? Numerous cases are now on record of individuals not deficient in understanding, who acquired knowledge readily and reasoned soundly and acutely on most subjects, who yet could never be taught the distinction between right and wrong, and who as they grew up gave way to their passions and instincts, entirely unaffected by a moral sense or by regard for public opinion. Often in these cases there was a hereditary predisposition to insanity. Are we not then forced to the conclusions of Dr. Woodward of the Massachusetts state lunatic asylum? "Beside a disease of the moral powers," says he, "there seems to be in some cases something like moral idiocy, or such an imbecile state of the moral faculties from birth as to make the individual irresponsible for his moral actions. The persons to whom I refer have rarely much vigor of mind, although they are by no means idiots in understanding."—Connected with the subject of moral insanity are the so called homicidal mania, pyromania, kleptomania, &c. The best marked of these is undoubtedly homicidal mania. A person whose reasoning powers are sound, suddenly, without cause, is guilty of a murderous assault. Sometimes there is only a sudden and irresistible

desire to kill. Repeatedly in such cases the patient, aware of his condition, has begged to be secured, or has warned the person whom he was about to attack to save himself; sometimes the attack is directed against a near and dear relation. A man mentioned by Marc applied for admission at Charenton on account of an impulse to kill his mother, to whom he was warmly attached, and which he felt himself unable to resist. In other cases there is a motive for the assassination, itself the product of a diseased mind. Thus a young woman, also mentioned by Marc, having witnessed a public execution, dwelt upon it until she desired to be similarly executed; kept from suicide by her religious convictions, to attain her end she killed a person toward whom she had no dislike. Again in other cases the patient hears voices directing the commission of the murderous assault; or he labors under the delusion that he will thus secure his eternal welfare, &c. The evidence for the existence of kleptomania, an insane propensity to steal, independent of any other mental affection, rests on cases which are now numerous and well authenticated, in which persons whose wealth and station in life place them above temptation, have yet had a habit of pilfering which they were unable to control and from which they reaped no advantage. Occasionally this form of insanity is connected with utero-gestation, manifesting itself only when the patient is pregnant. Pyromania, an insane desire to set fire to dwellings, &c., rests on precisely similar grounds. The terms dipsomania and cenomania have been appropriated to the insane desire for intoxicating liquors. It occurs under two forms, the periodic and the chronic. In the one the patient abstains for weeks or months from all stimulants, and often dislikes or loathes them; then comes on a craving for some alcoholic drink which proves irresistible; once yielding, he continues to drink for days or even weeks. A period of prostration and suffering follows, from which he gradually recovers, again to pursue the same course. The chronic form of the disease is frequently met with; here the patient, possessed by a ceaseless craving for stimulants, sacrifices every consideration of health, self-interest, and morality to its gratification.—Mania has commonly a period of incubation, though a short one, during which the coming paroxysm is foreshadowed by a departure of the patient from his ordinary mood and habits. "At first," says Esquirol, "trifling irregularities in the affections are noticed in the conduct of one whom the first symptoms of the malady begins to disturb. The maniac is at the commencement of the disease either sad or gay, active or indolent, indifferent or eager; he becomes impatient, irritable, and choleric. He soon neglects his family, forsakes his business and household affairs, deserts his home, and yields himself to acts, the more afflictive as they contrast more strikingly with his ordinary mode of life. To alternations of delirium and reason, of composure and agitation, succeed

acts the most strange and extravagant, entirely contrary to the well being and interests of the patient. The alarm and disquietude, the warnings and advice of friendship, paternal tenderness and love, oppose, irritate, and provoke the patient, exciting him by slow degrees to the highest pitch of mania." Sometimes, during the premonitory stage, the patient is gloomy and dejected; rarely he seems as if struck with stupor; at all times during the same stage sleeplessness is apt to be a marked characteristic. During the paroxysm the patient is in a state of violent and perpetual motion, attacking those who oppose him, tearing and destroying his clothes and the furniture of the apartment, gesticulating, talking, vociferating; he is filthy, and neglects his person. The pulse is commonly somewhat accelerated; the countenance may be flushed, natural, or pale; the pupil is for the most part unaffected. In a few cases sudden exhaustion supervenes, which may destroy the patient. When he survives, the disease may terminate in recovery, which in the great majority of instances occurs within the first 9 months, in chronic mania, in melancholia, or in dementia. Mania is the form assumed by the vast majority of cases of puerperal insanity; a few become affected with melancholia. In puerperal mania at the onset the pulse is commonly feeble and frequent, ranging from 120 to 140 per minute. The patient is apt to be exceedingly incoherent, and talks incessantly, often upon imagined wrongs that have been done her by her husband or her family. She takes sudden and violent dislikes, particularly to her child, her husband, and attendants. The use of filthy and obscene language, even by the most modest and virtuous of women, is a marked characteristic of the disease. A suicidal tendency is often present. The disease commonly occurs very soon after confinement. Of 66 cases reported by the late Dr. Macdonald of New York, 29 became deranged during the first week after labor, 15 in the next 3 weeks, making 44 cases during the first month. The disease terminates in recovery in a larger proportion of cases than in any other form of insanity, and the recoveries are more apt to be permanent. Of Dr. Macdonald's 66 cases, 53 recovered their reason, a fraction over 80 per cent.—The ultimate tendency of all cases of insanity when sufficiently protracted is to dementia. When completely formed, this, as remarked by Georget, is characterized by forgetfulness of the past, and indifference to the present and future. The patient is listless, unoccupied, so far as can be ascertained, by his own thoughts, and regardless of what is passing around him. Some remain for weeks without change of countenance, without speaking a word, or without making a gesture. Others from time to time smile or laugh without cause, or utter a few incoherent words or sentences which have no relation to what is passing around them. Friends and relations are not recognized, or no pleasure is evinced at their presence. While in this condition the patient's

physical health may be tolerably good; he eats and sleeps well, and often gains flesh. On this account improvement in flesh among lunatics, without a corresponding improvement in mental condition, is looked upon as an unfavorable symptom. While this condition is generally hopeless, still recoveries from it may take place. Pinel states that patients so affected have been attacked by acute mania, and after a paroxysm of 20 or 30 days' duration have recovered their reason. Prichard says the same effect sometimes follows a severe attack of fever attended with delirium; these cases are commonly fatal to lunatics, but if they recover reason may be restored. In the last stage of dementia, termed by some writers amentia, every trace of humanity seems lost. With a look characteristic of his fatuity, regardless of the calls of nature, unconscious of either hunger or thirst, the patient eats and drinks only when food and drink are put into his mouth; he rises or lies down only as he is lifted or laid down by his attendant; his life is merely organic. Such a condition is relieved only by death. For the last form of insanity, see IMBEC.—*Pathology.* Hitherto morbid anatomy has thrown little certain light upon the subject of insanity; for though in cases of long and continued insanity various alterations are found in the brain and its membranes, those alterations cannot be connected with the form of disease under which the patient has suffered. In dementia it would appear that the brain very constantly is in an atrophied condition. Beyond this, congestion and anæmia, thickening and adhesion of the membranes of the brain, and changes of color and consistence in the substance of the brain itself, are the phenomena chiefly met with.—*Causes.* One of the best recognized and most important causes of insanity is hereditary predisposition, which, as would appear, can be traced in nearly one third of all the cases. It has been observed by M. Baillarger, and confirmed by the late Dr. Brigham at the New York state lunatic asylum: 1, that the mother is more apt than the father to transmit insanity; 2, that the transmission of taint from the mother is more to be feared by the girls than the boys, while the contrary is the case with regard to the father. According to the statistics of the Bloomingdale asylum, as reported by Dr. Pliny Earle, the age of the patients on admission in the greater number of cases was between 20 and 30; then follow 30 and 40, 40 and 50, 50 and 60; then under 20, afterward returning to between 60 and 70, and 70 and 80. The number of cases occurring in the summer months is greater than at any other period of the year, while it is least in the winter months. On the other hand, perhaps from the greater activity of the intellect, insanity would seem more common in temperate than in tropical climates. The exciting causes of insanity are divided into physical and moral, and it is remarkable that in France the concurrence of a number of observers attributes by far the greatest influence to

moral causes, while in Great Britain and the United States the contrary is the case. Of the physical causes, intemperance in the use of alcoholic liquors is by far the most important; in India the use of Indian hemp has a similar effect; next follows epilepsy, then puerperal disease, diseases of the brain, injuries to the head, &c. Of the moral causes, the depressing passions, grief, domestic troubles, reverse of fortune, are by far the most important; then follow love and jealousy, terror, religious excitement, anger or excessive passion, &c.—*Prognosis.* It is found that of admissions into asylums for the insane, more than 40 per cent. are discharged as cured; but this does not represent the prospect of cure in a recent case. In the York retreat, for a period of 61 years, of those who were attacked for the first time and admitted within 3 months of the seizure, 73.1 per cent. were cured; of those attacked for the first time, over 3 months but within 12 months, 43.66 per cent. recovered; of those attacked a 2d or 3d time, and admitted within 12 months, 63.77 per cent. recovered; while of those admitted after the disease had lasted more than 12 months only 18.2 per cent. recovered. Of the forms of insanity, mania is cured in a larger proportion of cases than melancholy. Patients who have been cured of insanity are liable in a large proportion of cases to a second attack. Dr. Thurnam traced out the history of all who for a period of 44 years had been patients in the York retreat, and in whom death had occurred either in the asylum or after their discharge; the whole number amounted to 244. Of these, 113 died insane during the first attack, and 131 recovered; of the 131 recoveries, 45 died sane without a second attack, 20 had a subsequent attack or attacks, but died sane, 66 had subsequent attacks and died insane. This proportion of relapses is however esteemed too large by other observers. Lunatics sometimes attain an advanced age. Thus, according to M. Desportes, among the lunatics at the Bicêtre in the beginning of 1822, 1 had been in the institution over 56 years, 3 over 40, 21 over 30, and 50 over 20. Still the mortality among the insane is much greater than among the general population. During the first two years the mortality is especially high; after this the insane are liable to be carried off by diseases of the bowels, of the liver, of the heart, and by consumption, to which they are extraordinarily prone; and dementia, in which as we have seen old cases of in-

sanity often terminate, commonly ends in paralysis.—*Treatment.* Those experienced in the treatment of the insane recommend a well regulated asylum in preference to separate seclusion, even when that at an enormous cost can be properly obtained. In an asylum much will depend upon the building itself—its site, and its facilities for thorough ventilation, cheerfulness, cleanliness, and security. Early in insanity, where there are marks of congestion of the brain, and particularly where the patient is robust or plethoric, it may be proper to draw blood from the arm; more frequently the local abstraction of blood by means of cups or leeches is advisable. The head, where there is evidence of congestion of the brain, should be shaved, and cold may be applied to it by means of evaporating lotions or by compresses wet with ice water, which should be frequently renewed. Often the combination of the tepid bath is found to be particularly useful. The bowels, where constipation exists, should be kept regular by means of the compound rhubarb pill, or by small doses of aloes combined with extract of henbane. Where the secretion of bile is deficient, occasional doses of blue pill or of *hydrargyrum cum creta* may be useful, but the constitutional influence of mercury is to be avoided. Opium has been recommended to overcome the sleeplessness which is so marked a symptom in insanity, and is sometimes a valuable remedy; but its use is inadmissible where there are marked evidences of congestion. In chronic cases we must endeavor to maintain or restore the bodily health of the patient by every means in our power; and for this purpose a liberal diet, tonics, iron, the warm and cold bath, and gentle aperients, are among our chief agents. Moral treatment, as it is termed, is of more consequence than drugs, or rather, without the former the latter will be of little avail. Many considerations demand that an insane patient at as early a period as possible should be secluded from his friends and placed in an asylum. Beside the risk run of danger to himself and others, the presence of friends and relatives seldom fails to excite and exasperate a patient; they have rarely the moral qualities necessary for the care of an insane patient, and they have not the assistance and appliances at hand to enforce control, without recourse to a degree of violence which must prove injurious to the sufferer.—*Statistics.* The following table exhibits the latest general statistics of insanity in Great Britain and Ireland:

Country.	Whole No. of insane.	No. in asylums, hospitals, and workhouses, Jan. 1, 1858.	Admissions in 1858.	Discharges in 1858, including deaths.	Remaining Jan. 1, 1859.	Recoveries.	Deaths.	Per cent. of recoveries on whole No. resident.	Percentage of deaths on whole No. resident.	Percentage of recoveries on admissions.
England and Wales.....	29,858	22,013	8,146	7,243	22,910	3,079	2,306	13.9	10.47	37.78
Scotland.....	4,737*	3,295	1,294	1,099	3,453	456	263	15.0	8.20	37.70
Ireland.....	11,452	6,011	.....	.....	.....	.....	.....	.....	10.50	39.20

* Pauper lunatics only.

The following table presents a list and the latest statistics of American institutions for the insane:

Name.	Location.	Superintendent.	Date of report.	Patients at beginning of the year.	Admitted during the year.	Discharged.	Remaining.	Discharged cured.	Discharged not cured.	Died.	Percentage of recoveries.	Percentage of deaths.	Per. ct. of recoveries on the number of admissions.
State insane asylum	Anaconda, Me.	Dr. Harlow.	1858	208	126	126	208	59	43	24	25.80	11.60	46.82
"	Concord, N. H.	Dr. Bancroft.	1858-9	169	98	185	32	91	40	14	15.60	8.00	31.03
Insane asylum	Battleboro', Vt.	Dr. Rockwell.	1859	415	156	140	431	67	32	40	16.00	8.45	40.49
McLean asylum	Somerville, Mass.	Dr. Tyler.	1858	178	155	147*	186	72	44	25	38.84	13.10	46.49
State lunatic hospital	Worcester, "	Dr. Bonis.	1858	372	87*	801	127	219	54	31	27.80	11.30	31.50
"	Taunton, "	Dr. Choate.	1858	927	223	249*	801	145	125	40	26.70	12.10	37.67
"	Northampton, Mass.	Dr. Prince.	1858	228	140	47	135	92	18	12	16.10	5.80	46.50
Butler hospital	Providence, R. I.	Dr. Ray.	1858	208	141	52	135	92	18	12	16.10	5.80	46.50
Insane retreat	Hartford, Conn.	Dr. Butler.	1858-9	184	215	61	134	91	10	4	24.05	4.70	43.84
State lunatic asylum	Utica, N. Y.	Dr. Gray.	1859	451	833	282	502	114	83	31	24.95	6.51	34.59
City lunatic asylum	New York, N. Y.	Dr. Ranney.	1858	627	835	327	625	164	71	92	25.60	14.80	46.19
Bloomington asylum	"	Dr. Brown.	1859	146	112	113	145	34	65	11	23.28	7.53	30.35
King's co. lunatic asylum	Flushing, "	Dr. Lansing.	1858	238	201	11	268	76	65	27	30.04	10.67	37.81
Criminal insane asylum	Auburn, "	Dr. Hall.	1859	65	181	151	230	63	50	15	27.40	7.53	45.09
Hospital for the insane	Philadelphia, Penn.	Dr. Kirkbride.	1858	230	131	181	230	63	50	15	27.40	7.53	45.09
Asylum for persons deprived of the use of reason (F-Fields).	Frankford, "	Dr. Smith.	1858	406	376	366	416	115	140	111	27.97	27.00	30.59
State lunatic hospital	Harrisburg, "	Dr. Worthington.	1858	62	24	24	62	11	10	8	17.70	5.00	45.55
Western Pennsylvania insane hospital	Pittsburg, "	Dr. Curwen.	1858	250	151	184	267	36	84	14	13.95	5.32	23.84
State lunatic asylum	Trenton, N. J.	Dr. Reid.	1858	279	146	133	293	62	51	16	21.67	5.59	37.70
State lunatic hospital	Baltimore, Md.	Dr. Fonerden.	1857	110	43	45	108	12	27	6	11.90	5.50	27.90
Mt. Hope institution for the insane	Williamsburg, Va.	Dr. Stokes.	1858	147	138	140	145	61	62	17	41.78	11.64	44.34
Eastern Virginia insane asylum	Stanton, "	Dr. Galt.	1858	232	161	136	257	32	35	69	13.06	28.16	19.25
United States government hospital	Raleigh, N. C.	Dr. Strubling.	1858	388	136	135	859	62	27	46	15.93	11.83	45.69
Insane asylum	Washington, D. C.	Dr. Nichols.	1858	110	43	36	117	15	5	13	13.80	11.40	41.56
"	Columbia, S. C.	Dr. Fisher.	1858	138	57	49	146	24	16	9	16.90	6.24	42.10
"	Jackson, Miss.	Dr. Parker.	1857	187	69	63	193	35	7	21	18.44	11.05	50.72
"	Baton Rouge (?), La.	Dr. Kells.	1858	83	59	36	106	21	9	2	22.20	14.50	38.09
Tennessee asylum	Nashville, Tenn.	Dr. Barknall.	1858	125	84	73	137	32	14	27	24.40	20.60	35.09
Western Kentucky asylum	Lexington, Ky.	Dr. Chipley.	1859	226	45	43	228	19	15	9	21.21	14.39	22.19
Missouri asylum	Hopkinsville, Ky.	Dr. Montgomery.	1858	87	95	74	108	38	18	18	35.77	8.36	42.22
Northern Ohio lunatic asylum	Fulton, Mo.	Dr. Smith.	1858	135	122	86	171	45	19	22	24.91	14.37	36.58
Central	Sandusky, O.	Dr. Kendrick.	1857	141	140	133	143	75	64	4	52.08	2.80	53.87
Southern	Cincinnati, "	Dr. Hills.	1858	259	175	179	235	101	59	19	39.34	7.39	57.71
Hamilton co.	Indianapolis, Ind.	Dr. McIlhenny.	1858	161	116	117	160	73	27	17	45.60	10.60	62.83
Indiana insane asylum	Jacksonville, Ill.	Dr. Monet.	1858	179	158	107	230	46	49	12	22.55	5.83	29.11
Illinois	Stockton, Cal.	Dr. Athon.	1858	71	800	104	277	81	14	8	46.55	4.60	26.12
California	Stockton, Cal.	Dr. McFarland.	1858	214	312	297	229	164	91	42	73.87	19.52	52.50
Canada West Provincial asylum	Toronto, C. W.	Dr. Aylett.	1858	162	86	60	188	16	27	17	9.14	9.71	18.60
New Brunswick insane	St. John's, N. B.	Dr. Workman.	1858	466	87	75	478	57	18	12	12.20	3.81	65.51
		Dr. Waddell.	1858	149	87	81	155	37	18	26	24.34	17.10	42.50

Beside the above, there are insane hospitals which have as yet published no printed report in Albany, in Troy, and in Hamilton co., N. Y., in Kalamazoo, Mich., and in Quebec, C. E.; and others not yet opened in Georgia, Iowa, Wisconsin, and Texas. There are also private insane asylums in Massachusetts, Connecticut, New York, and Pennsylvania, and a city insane hospital in Boston, of which we can find no recent report.

* Many of the discharges were to the Northampton and other hospitals, in consequence of new arrangements.

† Just opened at the time of making the report.

‡ Recently opened.

—*History.* The earliest sacred and profane writers allude to the existence of mental unsoundness. In Deut. xxviii. 28 the Israelites were threatened with madness if they disobeyed the divine commands; David feigned madness when he visited Achish the first time; Saul was subject to paroxysms of melancholia; Nebuchadnezzar seems to have suffered from a form of lycanthropy. In the New Testament the most remarkable of Christ's acts of healing were performed on lunatics. In Egypt the treatment of insanity by the priest-physicians attained to the dignity of a science, and the improved methods of the present day are little more than an adaptation of their course to modern times and usages. The Asclepiadæ in Magna Græcia were very successful in the treatment of lunatics. Their temples of health placed on commanding eminences were thronged with the insane, to whom a short residence often brought a happy restoration. Pythagoras, who added to his many other accomplishments that of a physician, relied on music and pleasant physical exercise to bring back the lost reason. Hippocrates was successful in restoring the insane to reason. Celsus was the first to distinguish several varieties of insanity. In the 5th century occurred the first of those epidemics of mental disorder, which subsequently became so frequent and wide-spread during the middle ages; the Flagellants appeared in Italy, and hundreds were infected with the insane desire to subject their naked bodies to torture. The most remarkable of these epidemics were the lycanthropy of the mountainous districts of Austria and Italy; vampirism, which prevailed over the south of Europe; the tarantula in Italy, and the dancing mania in Germany in the 13th and 14th centuries. During all this period there were but few insane hospitals, and in these few stripes and chains were the only medical treatment. In Constantinople and Bagdad were houses of mercy, as they were called, in which the poor lunatics were chained and received from charity their daily bread, and from their keepers a weekly beating. The earliest mad houses, so called, in western Europe, were Bethlehem hospital, London, usually called Bethlem or Bedlam, the Bicêtre and the Salpêtrière in Paris, and one or two in Germany. In all these, filth, starvation, chains, and the free use of the rod were the lot of the unhappy maniac, while the most quiet cases were sent out to beg, and were known as Tom-o'-Bedlams. Insanity is, to a very great degree, a disease of high civilization. It is rare among the African tribes and among the Indian tribes of America, because the mind is but little exercised. Dr. Livingstone states that he found not more than one or two instances among the tribes he visited; but one of the Bakwains, who was to accompany him to Europe, became insane from the throng of new ideas which oppressed him, and committed suicide on board ship. In China insanity is rare, from the strict despotism under which the people live restrain-

ing mental action; but since the great rebellion commenced it has increased, and fatuity, the result of the excessive use of opium, has also become prevalent. In India there are comparatively few lunatics. In Italy and Austria insanity is less frequent than in countries enjoying more political freedom. In France the proportion of the insane is about 1 to 1,000 inhabitants; in England, 1 to 783; in Scotland, 1 to 563; in the United States, about 1 to 750.

INSECTS, six-footed articulated animals, the most beautiful, most active, and most highly organized of the *invertebrata*, in which, anatomically considered, they bear a remarkable analogy to birds among the vertebrates. Like birds they inhabit the air, earth, and water, have an extensive respiratory apparatus, and consequently a higher calorific and motor power than any other invertebrates. The number of species and of individuals is exceedingly great, and their metamorphoses are among the most interesting phenomena in nature. The class of insects includes all articulates having a distinct head, thorax, and abdomen, with antennæ, 3 pairs of feet, an aerial respiration by means of tracheæ, a feebly developed circulating system, almost all being winged and undergoing transformation. The cutaneous envelope forms a kind of external skeleton, generally of a horny consistence, formed principally of chitine; it is made up of a considerable number of pieces more or less movable on each other, and is frequently provided with hairs, which are sometimes sharp and barbed (as in the processary caterpillars), producing considerable irritation when introduced into the human skin. The limbs, which are appendages of the thorax, are hollow tubes containing the muscles and nerves for their motion. The first segment constitutes the head, on which are placed the antennæ, the eyes, and the oral appendages. The antennæ are composed of a variable number of joints, generally resembling delicate and flexible horns, plumed, serrated, clubbed, or foliated, according to genera and families; they are principally organs of touch. The mouth in the chewing insects, like the beetles, cockroaches, and grasshoppers, consists of an upper middle piece or *labrum* with a mandible on each side, the latter being very hard, often toothed at the extremity; the *maxillæ* or under jaws are softer and of many pieces, with maxillary jointed palpi, and the central piece is the *labium* or under lip, also supporting jointed palpi. At the base of the under lip is attached the tongue, which in some is abortive and in others long and changed into a suctorial organ. In the sucking insects the under lip is transformed into a tube, enclosing delicate lancet-like filaments or bristles, modifications of the mandibles and maxillæ; in the *hymenoptera* (bees, &c.) the mouth is intermediate between the chewing and the suctorial, having parts belonging to both; in the *lepidoptera* (butterflies, &c.) the mandibles are very small, but the under jaws are changed each into a semi-canal which

may be rolled up spirally. The eyes are either simple or compound, the first occurring chiefly in the larvæ of the metamorphic orders, and the second in perfect insects; some have both kinds in the perfect state, and some adults, larvæ, and pupæ are blind. The compound organ is made up of many simple eyes, each having its cornea, conical vitreous body, pigment, and nervous filament; the number of these facets is sometimes more than 25,000. The simple eyes (*stemmata*) consist of a cornea, lens lodged in an expansion of the optic nerve, and a surrounding pigment layer; they are placed either on the sides of the head, or in small groups on the vertex. The thorax supports the legs and wings, and consists always of 3 rings, called respectively *prothorax*, *mesothorax*, and *metathorax*, each bearing on its ventral arch a pair of legs; the wings arise from the dorsal aspect of the 2 posterior rings. The limbs consist each of a 2-jointed hip, a thigh, a leg, and a kind of finger or tarsus of 2 to 5 joints terminated by the claws; in the jumpers, like the grasshoppers, the hind legs are very long and muscular; in the swimmers, like the water beetles, the tarsi are flattened, ciliated, and arranged for oars; in the flies, the feet are provided with pads and hooks by which they are enabled to hang suspended from smooth surfaces; the anterior limbs are often enlarged, as in the mole crickets, which dig in the ground, and armed with spines, as in the mantis, which uses them to seize its prey; in some of the butterflies the anterior limbs are mere rudiments, useless as means of progression. The wings are membranous expansions, rendered firm by solid nervures; there are never more than 2 pairs, and one or the other may be wanting; in the butterfly they are covered with a colored dust consisting of microscopic scales; in the beetles the first pair becomes thick and hard, forming the *elytra*, which cover and protect the second pair; the wings are sometimes half membranous, half corneous, at others divided into barbed plumules, or wanting and replaced by the knob-like balancers. The legs and wings are moved by striated muscles, attached directly to the cutaneous skeleton; those of the wings of the *diptera* have their fibrillæ separable into series of disks, the astonishing rapidity of their movements being dependent on alternate contraction and relaxation. The abdomen is composed of rings movable upon each other, sometimes to the number of 9; they bear in the perfect insect neither legs nor wings, but are provided with various appendages useful in the economy of the animal, as the delicate bristles of the ephemera, the nippers of the earwig, the spring of the podurella, the sting of the bee and wasp, and the ovipositor of the grasshopper and the ichneumons. Beside the antennæ, the palpi about the mouth, the end of the suctorial tube, the ovipositor, and the feet in some instances, are delicate organs of touch; the tongue, when present, as in bees and flies, is undoubtedly the seat of an acute sense of taste. Though insects

apparently perceive by the sense of smell what food is proper for themselves or their young, the seat of this sense has not been satisfactorily determined; Duméril and Cuvier, reasoning from analogy, concluded that it was placed at the openings of the respiratory tracheæ; Huber, from his experiments on bees, placed it in the mouth, Kirby in the anterior portion of the head or the nose, and others in the antennæ and palpi. Hearing is acute in many insects; the shrilling of the locust, the tick of the deathwatch, the song of the cricket, &c., would be useless unless they could be heard by their companions; in the *orthoptera* especially an auditory apparatus is connected with the stigmata of the thorax and the anterior legs; the sense has also been placed inward at the base of the antennæ. The sounds of insects are produced by the friction of one part of the external skeleton on another, by the vibration of special organs, or by a particular soniferous apparatus, always due to the action of voluntary muscles and unconnected with the respiratory system; the buzzing of flies seems to depend on the rapid vibrations of the thorax during flight and on the passage of air through the thoracic stigmata, perhaps intensified by the motions of the wings themselves; some beetles produce a sharp sound by rubbing the last abdominal segments against the curved points of the wing covers, or the thoracic rings against each other; the sounds of butterflies and of the death's head moth are referred to friction of the hips together, and to various causes not at all satisfactory; the special soniferous apparatus of the cricket, grasshopper, harvest fly, and locust, is described under each title respectively. The nervous system consists of a brain and spinal cord; the former is constituted by the ganglia which embrace the œsophagus, and is situated in the 1st segment; the spinal cord is made up generally of a double series of ganglia united by longitudinal cords, in number corresponding to that of the segments of the body; the 3 thoracic ganglia are much the largest, and from them are given off the nerves to the legs and wings. The alimentary canal is generally complicated and more or less convoluted; it consists of a pharynx, œsophagus, 1st stomach or crop, 2d or gizzard with muscular walls for trituration, 3d or chylific ventricle of soft and delicate texture, a small intestine, cæcum, and rectum; as in the higher animals, it is shortest in the carnivorous families, and very long in the vegetable feeders; it is kept in place by numerous fine tracheæ which envelope its whole extent; in the sucking insects, there is also a sucking stomach opening from the œsophagus, into which the fluid food is first taken, as in the 1st stomach of ruminants. The anus opens on the last segment, except in some non-feeding pupæ, in which both it and the mouth are wanting; the salivary glands are well developed, opening into the pharynx; the villousities of the 3d stomach seem to secrete a gastric juice, the biliary secretion being poured into this cavity; the office of a liver is per-

formed by cæcal appendages lying upon the ventricle; similar organs on the small intestine sometimes perform the office of a pancreas. An adipose tissue is found in all insects, especially toward the end of the larva state, gradually disappearing in the perfect condition, freely traversed by trachean branches; the fatty contents are intimately connected with the functions of nutrition. The circulatory system consists of a contractile chambered dorsal vessel which serves as a heart, and a cephalic aorta which conducts the blood into the body; the blood moves from behind forward, and passes from the aorta all over the system, forming regular currents without vascular walls, and returning as venous blood to the lateral vessels; the blood is usually a colorless liquid, containing a few small oval corpuscles. Respiration is carried on by a system of tracheæ spread through the entire body, which open externally by stigmata, and admit air either directly or by means of lamelliform or tubular prolongations which have been compared to branchiæ; they divide into branches, gradually becoming smaller, ending cæcally, so that the air passes out by the same way that it enters. The branchial tracheæ are found in certain aquatic larvæ and pupæ, and never in the perfect insect; they do not communicate externally, but the air is received by endosmosis and exosmosis. The stigmata of the pulmonary tracheæ are usually bordered with a fringe of hairs, and can be opened and shut by internal muscles, whose action gives to the abdomen of many insects well marked movements of respiration; there is generally a pair on the upper portion of the interstices between each ring, being wanting between the head and prothorax and the last 2 abdominal segments; the tracheæ are often dilated into large reservoirs of air. Respiration is very active in insects, and performed by the movements of the abdominal segments; they require a great deal of air, and are very quickly asphyxiated by deprivation of oxygen; though not producing much animal heat ordinarily, sometimes, as in the bees when hived, the respiration is accelerated and their temperature perceptibly elevated. The phenomenon of phosphorescence has been sufficiently explained in the articles *FIREFLY* and *GLOW-WORM*. The Malpighian vessels, which were formerly supposed to be biliary, are now ascertained to be urinary organs, secreting uric acid products; they are small tubes, more or less long and convoluted, of a yellowish or brownish color, and open into the posterior extremity of the stomach. Many insects have secretory follicles just under the skin, whose ducts open between the segments or between the joints of the limbs, or by the side of the anus; the fluid secreted is generally of a disagreeable odor, and sometimes, as in the bugs, very fetid. The females in many of the *hymenoptera*, as the bees and wasps, have a glandular apparatus in the anal region, which secretes an irritating poison introduced into the tissues of their enemies by their hollow stings. Most insects undergoing a

complete metamorphosis have in their larva state silk organs, whose secretion they use in the formation of their cocoons and webs; they consist of 2 long, flexuous tubes on the side of the body, continuous in front with 2 small excretory ducts opening on the under lip; in a few the silk is spun from a spinneret projecting from the anus; the wax-secreting apparatus has been described under *BEES*. The sexes are distinct, and the females often differ greatly from the males, as in the glow-worm; among the bees and ants the females are much less numerous than the males, and certain individuals of neither sex, or neuters, do the work and protect the colony. Most insects lay eggs, though a few, like the *aphides*, are viviparous; by means of an ovipositor many introduce their eggs into a deep-seated nidus, in or near which the young can find the food suited for them, almost always different from that required by the parents. There are generally 2 symmetrical ovaries and testes, situated in the abdominal cavity, and 2 oviducts uniting into a single one at the posterior end of the body. In the article *APRIS* will be found an account of the remarkable reproduction of females only for several generations, which in their turn reproduce viviparously and without direct intercourse with the males.—In their progress to maturity insects change their skins many times, and many of them undergo transformations as singular as those already mentioned in the frogs; on coming from the egg they are very different from their parents and from their pupa forms. Before arriving at their perfect state they usually pass through the larva and pupa form, which may be entirely different, or vary chiefly in the development of wings, according as the metamorphosis is complete or not. Insects with complete metamorphosis when they leave the egg or are in the larva state are more or less worm-like, with an elongated soft body divided into movable rings, normally 18 in number, sometimes with and sometimes without feet; in no respect do they resemble the parents; the eyes are generally simple, and occasionally absent; the mouth is almost always armed with jaws for chewing, even in insects which are sucking in the perfect state; these larvæ are called caterpillars or maggots, according to their size, form, and habitat. After remaining in this state, either in the water, in the air, or under ground, a certain length of time, varying according to the species, and undergoing several moults, rudimentary wings form under the skin, and they change into nymphs, chrysalids, or pupæ; the larval condition persists sometimes for several months, as from the autumn to the following summer, and in the case of the harvest fly for a much longer period. Larvæ are generally voracious and active, but nymphs are as generally motionless and do not eat; sometimes the larval skin hardens into a shell-like covering for the nymph; at others a thin investing pellicle applied to the body permits the animal to be seen through it. Before undergoing this change the larva often prepares a shel-

ter, making a cocoon of silk secreted by itself; the nymph may be suspended from a twig by silken filaments or concealed in some crevice. In the nymph state growth rapidly takes place, and the form of the future insect is gradually assumed. The metamorphoses are easily studied in the common caterpillars, the bee, the mosquito, the fly, and the silkworm. The life of the perfect insect is short, enduring at most for the summer months, until the work of reproduction is completed; in the ephemera the adult state continues for a few hours only, an emblem of the transitoriness of earthly pleasures. As instances of incomplete metamorphosis may be mentioned the cockroach, the cricket, the grasshopper, and other *orthoptera*, in which the larva differs from the perfect insect principally in the absence of wings. For further details on larvæ and pupæ, the reader is referred to CATERPIL-LAR, CHRYSALIS, and the various insects in their respective order. As insects furnish food for a great variety of vertebrate and invertebrate animals, their extermination would ensue were it not for their astonishing fecundity, paralleled only in the case of fishes; a female *termites* (ant) has been estimated to lay about 90,000 eggs in a day; the queen bee deposits between 5,000 and 6,000, the common ant about 1,000 less, the wasp about 3,000; a posterity of 1,000 in one generation is common; in the silkworm the average is 500; the beetles are far less prolific. Réaumur observed 350 young ones developed from the numerous eggs of a moth (*phalæna*), many of which died as caterpillars, so that only 65 females reached the perfect state; these were calculated to produce the following year 22,750, which in the next would produce 1,500,000. A single plant louse (*aphis*), which brings forth a numerous progeny, but only one at a time, according to the above author's calculation, would produce in the 5th generation about 6,000,000,000, the great-great-grandmother laying eggs when the 9th member of her descendants is capable of reproduction without contact with the male.—The muscular activity of insects is very great, whether in leaping, swimming, flying, digging, or carrying weights; no mammal can leap in proportion so high or so far as the flea, to a distance more than 200 times the length of its own body; no bird has a facility of motion, and a rapidity and endurance of flight, comparable to those of insects. The wings of the butterfly have been found to display the structure ascertained by civil engineers to combine the greatest lightness with the greatest strength; in the nervure of the wing, as in the strongest beam, the utmost possible material is thrown into the flanges, and the upright support is as thin as practicable; in the hollow nervures we have two flanges connected by the thin membrane of the wing, and the strongest nervure at or near the anterior edge. The apparatus by which many insects walk upon perpendicular surfaces has been described in the article FLY. The larva of the ant lion digs its sand pit, and the fossorial wasp a hole

for its eggs, in a very short time; a few ants are strong enough to drag from their hill a large caterpillar; a few burying beetles will place a mole under the earth in an hour, a feat equivalent to as many men burying a large whale in the same space of time; the gadfly is faster than the fleetest horse; a humble bee has been known to distance a steam carriage going at the rate of 20 miles an hour, and a dragon fly to lead a swallow a weary chase of an hour, and at last escape. Kirby and Spence give a multitude of details on this interesting subject. The instincts of insects, which sometimes closely border upon intelligence, are very remarkable, and calculated to excite the admiration of the most superficial observer. Insects apparently acquire knowledge from experience, possess the faculty of memory, and are able to communicate their purposes to their fellows; they evince great sagacity in their methods of procuring food and in defending themselves against their enemies; their devices for entrapping prey are very ingenious; to escape their enemies, some feign death, and others conceal themselves, fight bravely with their jaws and stings, and emit a nauseous odor or corrosive juices. As examples of insect instincts we need only mention those of the bee, wasp, and ant in constructing their habitations, of the silkworm, of the caterpillars (like *tortrix* and the clothes moth), which roll up leaves or woolly materials for their protection, of insects which unite in communities for mutual protection and support, and of those which lay their eggs on substances most proper for their young, which they will never see, and which feed on matters entirely different from their parents (as the wasps). In their adaptation of these instincts to accidental circumstances, they approach very near to intelligent acts. Insects have many passive means of avoiding their enemies in the form and structure of their bodies, and in their resemblance in color to the objects on which they live, whether ground or tree, as in beetles, grasshoppers, the mantis, and many bugs living on bark; the larvæ of tortoise beetles are spiny, others are hairy, and consequently avoided by insectivorous birds; beside these, the hardness of integument and tenacity of life are important means of defence. The continuance of the species is secured by the strong sexual impulse, and by the care of the female in depositing her eggs in places where the future welfare of the young will be insured; the life of the insect generally ceases soon after the period of sexual activity; among the social insects, the young are fed by the neuters and females. For details, see Kirby and Spence's "Introduction to Entomology."—The relations of insects to the rest of organic nature are very interesting and important. Most insects derive their food from the vegetable kingdom, to which they are both injurious and beneficial; by their simple agency not only is a limit set to the increase of plants, but their preservation is due in many instances to insect operations. Myriads of larvæ feed upon the roots, leaves, flow-

ers, fruits, wood, and seeds of plants, not sparing the grains and vegetables most useful to man; the work of Dr. Harris on the "Insects Injurious to Vegetation" gives ample details on this point as far as the northern portion of the United States is concerned, and many of his observations are given in this work in the articles relating to these destructive creatures. On the other hand, fecundation in plants is often promoted by insects; butterflies, bees, wasps, flies, and beetles convey the pollen to the female organs, and thus impregnation is effected in many cases where it would otherwise be unlikely to occur. Insects afford food for each other, for spiders, for many fresh water fishes, amphibians, reptiles, birds, and mammals; and the last two, with man himself, are infested with many parasitic insects. (See EPIZOA.) The direct advantages derived from insects by man are not a few; many larvæ of beetles, grasshoppers, and locusts, South American ants, &c., are occasionally used as food by various savage tribes; the bee supplies honey and wax, the *coccus* manna and cochineal, the Spanish fly a well known blistering drug, the gall insects a valuable astringent, the silk-worm a most valuable and beautiful material for clothing, &c.; and the larvæ of flies and many beetles are useful scavengers in removing decomposing animal matters.—Insects are found everywhere, even on the surface of the ocean (*hydrometradæ*), but they are essentially animals of the air; though a few may be seen in winter, most are active only in the other seasons of the year; the winter is passed in a state of hibernation, either as eggs, larvæ, pupæ, or in a few instances as perfect insects; those of tropical regions are the largest, most numerous, and most gorgeously arrayed; they have been found within 8 degrees of the north pole, but their geographical distribution has not as yet received the attention it deserves; some are restricted within narrow limits, while others are almost cosmopolite. Insects of a former geological age are found in amber, a fossil resin, in most cases coming very near existing forms, and sometimes of living genera; the number of species thus found is considerable, and, though pertaining only to such as dwelt in woods or on trees, it may reasonably be concluded that then, as now, the insect world was exceedingly well filled; the beetles are well represented, the *hymenoptera* very abundant, the *lepidoptera* exceedingly rare, the *diptera* and *neuroptera* very numerous, the *orthoptera* and the *hemiptera* not common. Insect impressions have been described in the calcareous formations, especially such as might have been made by aquatic larvæ and insects; Dr. Hitchcock describes footmarks in the sandstone of the Connecticut valley, as having been made probably by several genera of insects.—From the above remarks it will be perceived that the study of insect life is of considerable importance to man; they are more numerous in species than any other animals, more brilliant and varied in their colors, and display a wonderful adaptation of

structure to their habits which forms one of the strongest proofs in the chain of evidence of the existence and intelligent agency of an all-wise and benevolent Creator.—For the systematic classification of insects, and the history of the science, see ENTOMOLOGY.

INSURANCE, in law, a contract whereby an insurer engages, for a consideration which is called a premium, to insure a certain party against loss of or injury to certain property by certain perils. The word peril here means not the danger but the happening of the event which was feared. When the contract is in writing, the instrument is called a policy of insurance. Marine insurance is the insurance of maritime property against maritime perils. Fire insurance is the insurance of houses or goods against fire. Life insurance may be called insurance against death; it is, however, a contract to pay to certain survivors a certain sum on the death of the party whose life is insured. I. MARINE INSURANCE was wholly unknown to the Greeks and Romans, and to oriental nations. Chief Justice Coke (6 Rep. 47), about 1588, notices the practice of insurance as mere novelty, and the first English statute which recognizes it is 43 Elizabeth, c. 12 (1601). But the 66th section of the laws of Wisby (a maritime code published, probably, about 1250) speaks distinctly of it. Some suppose this a subsequent interpolation; but it is at least possible that the practice of insurance was more or less common among merchants, even centuries before it was recognized by the law. It is, at all events, no older than the close of the middle ages; and it must be regarded as prominent among the many illustrations of that tendency to association which is at once the effect and the cause of our advancing civilization. By means of insurance the resources of many are aggregated for the protection of each. Merchants become members of what is often called, and by the universal practice of insurance becomes, the mercantile community. Each one pays over a part of his profits, so small as not to inconvenience him, and thus obtains protection against a loss which would crush him; and what he pays helps to form the fund that indemnifies others. Hence, commerce is promoted and developed to an extent far beyond what would otherwise be possible, because enterprises become not only possible but prudent by means of insurance, which without it would be so rash that only the reckless would undertake them. The whole law of insurance has grown out of the business of insurance, and has therefore originated in the sagacity and experience of merchants, courts doing very little more than adopting and enforcing their usages. The fundamental principles of this law, which will help us in the adjustment of all particular cases, may be learned from the purpose of insurance. Thus, it is easy to say, as some do, that insurers should not be strict in their requirements, nor rest upon technical defences and the letter of the law. But all the losses paid by insurers

must be paid out of premiums, or the business of insurance would stop; and these premiums must grow higher as the risk increases; and when they get so high as to be much beyond the actual risk incurred by prudent and substantial men who take care that their ships are what they should be, such men will no longer insure. Then the business of insurance will fall into the hands of the careless and the unprincipled, and then premiums must rise still further, and the mischief in this way confirm and enlarge itself. Instead of being upheld to commerce, insurance will then only derange it, and be little better than legalized gambling. Similar principles will be seen, as we proceed, to be applicable to every part of the law of insurance; because the whole effort of the law is to make the business of insurance prudent and satisfactory, for merchants who transact a legitimate business honestly and carefully. Contracts of insurance may be made, generally speaking, by all persons competent to make ordinary contracts of business. Formerly much business was done by individual insurers, or underwriters as they are often termed from their subscribing the policies. Now, however, nearly if not quite all policies of insurance, in this country, are made by incorporated companies. These are of two kinds: 1, stock companies, where the stock is owned by persons who receive the profits (that is, the excess of premiums over losses) by way of dividends; 2, mutual companies, where the profits (deducting only the expense of transacting the business) are divided among the insured, or so applied to reduce the premiums that each insured pays only the equivalent of his actual risk. Some companies, which operate on the mutual principle, have also a certain amount of capital stock as a basis.—Large volumes are written about the law of insurance. In this article we shall endeavor to exhibit only a brief and condensed statement of its leading principles. The contract of insurance ought always to be in writing; but it may be binding if only oral, unless the insurers are an incorporated company, forbidden by their charter to insure otherwise than in writing. An agreement to insure, entered and subscribed in the usual way in the books of the insurers, would generally be held to be a contract binding both parties to the terms usual in the common policies of those insurers. And it seems to be the settled law of the United States, that a contract is made by letter, when either party, receiving a letter of proposals, puts into the mail an answer of acceptance, without having previously received a letter from the proposing party retracting his proposals. A policy is a very ancient instrument, and is substantially the same everywhere, but with special variations. It is subscribed only by the insurers, but the bargain binds also the insured, if he accepts the policy, and puts his property at risk under it. A policy may insure A specifically, or A "for whom it may concern," or use other equivalent words; and the effect of these words is to bring within

the scope and benefit of the insurance every person interested in the property who authorized the insurance, and who was contemplated by A as being insured; or who, being so interested and contemplated, afterward in good faith adopts and ratifies the insurance. Sometimes the policy defines and exactly describes the property insured; sometimes it leaves this undetermined, but requires that it shall afterward be defined, in writing on the policy, as such or such property aboard of such or such a ship; the latter is called an open or running policy. Alterations made by agreement are valid, and are in practice often made and indorsed upon the policy. But a material alteration by the insured, without the assent of the insurer, destroys all claim against the insurer, and is said to have this effect although made in good faith, and with the expectation of obtaining his consent. An alteration by the insurers without the consent of the insured has no effect whatever. If there be a material mistake in the policy, courts having equity powers will sometimes amend it. A policy of insurance is not negotiable; yet, if transferred for value, in good faith, the transfer may be so far valid (if not prohibited in the policy itself) as to give the assignee a right to sue in the name of the insured, or, in some states, in his own name, but always subject to any equitable defences which could be made against the insured. But an assignment or transfer of the property insured, before a loss, without a corresponding transfer of the policy with the consent of the insurers, destroys the claim of the insured, and gives none whatever to the assignee. If a loss has taken place, and a claim to indemnity vested in the insured, he may now transfer this claim. The insurers have a right to choose whom they will insure and whom they will not; and therefore they cannot be made by the insured against their will to insure a new party. But if the bankruptcy of the insured transfers his property and with it the policy to assignees, the insurers are still held; and on the death of an insured, the property and policy go to his legal representatives. Whatever is written on the face or back of the policy, and is referred to in the policy as a part of it, becomes a part of it; and so is a separate paper, if distinctly made a part by reference which amounts to an agreement. Policies which insure a person who has no interest in the property, are called wager policies. Formerly they were permitted, but are not legal or valid now either here or in England; it being a universal rule that the insured must have some interest in the property, and this interest must be at risk. If the policy be what is called an open policy, that is, if the interest be not valued therein, and a loss occurs, the insured proves his interest or the value of the property, and is paid accordingly. But the policy may be what is called a valued policy; that is, A may be insured "\$10,000 on the ship Orion, valued at \$20,000." This binds both parties,

unless there be an over valuation so extreme as to be fraudulent, or to be equivalent to a wager policy. If A is insured as above and the ship is totally lost, he receives \$10,000; but if the ship is partially lost, or injured to say one half of her value, then he receives \$5,000; because by causing himself to be insured only half of her agreed value he is considered as standing his own insurer for the other half. But if he be insured a round sum, without any valuation, he will receive the whole amount insured, provided he can show that he has lost so much by a peril insured against.—The subjects of marine insurance are four: the ship, the cargo, the freight which the ship may earn, and the profits upon the cargo. Either may be valued; but it is common to value a ship, and not so common to value either of the other interests. If goods are valued, it is perhaps for the purpose of insuring the profits, by including them in the valuation of the goods, without insuring the profits under that name. It is not very common to insure profits by themselves; but when this is done, they are usually valued, although this is not necessary. If valued, and the goods are lost, the English courts require proof that they would have made some profit. In the United States the courts consider the loss of goods as implying the loss of some profits, and the valuation settles the amount.—Any kind of interest will support an insurance, if it be such that a loss of the property will bring on the insured direct pecuniary loss. Any bailee of the property (or one having possession of it) may insure it if he have any interest in it or responsibility for it. If the property be mortgaged, both mortgagee and mortgagor have an insurable interest in it; so have factors on commission (or commission merchants), consignees, agents having possession, or carriers. The owner of the ship acquires an insurable interest in the freight it will carry as soon as he has received the goods of another to be carried, or has purchased goods to be carried in his own ship, or has made a distinct and obligatory contract with some one to ship them, and his vessel is at or on the way to a port to receive them. The contract of insurance is wholly void if the interest insured be illegal; or if a material and inseparable part of the contract or transaction is illegal; or if it distinctly contemplates an illegal use of that which is insured. But by illegal is meant contrary to the laws of the country where the contract is made and is to be enforced. Thus, an insurance in America, to cover goods intended to be smuggled into England, would not be void in America, but would be in England. Some contracts of insurance are prohibited by the mere policy of the law; thus, a mariner cannot make a valid insurance of his wages, because it is important that he should feel the danger of losing them if the ship be lost.—The subject of warranties in marine insurance is very important. These are promises of the insured that certain things exist or do not exist, or shall be or shall not be

done; and if the promise is broken the contract is void, whether the promise is material or not, and whether the breach of the promise be the fault of the insured or not. And they must be exactly complied with; "nothing tantamount will do," said Lord Mansfield. But the warranty will still be construed reasonably, and according to the usage of merchants and insurers, and the honest and actual intention of the parties. The warranty may be express or implied by law. If express, it must be written on or in the policy, or by distinct reference made a part of it. Any distinct assertion amounts to a warranty; if the ship be described as "the American ship Flying Cloud," this is a warranty that she is American. Express warranties are most usually: 1, of ownership; 2, of national character; 3, of the lawfulness of the goods or voyage; 4, of the taking of convoy; 5, of the time of sailing. Of these we pause upon the last only, to say that, after some uncertainty, it is now clear that a ship sails when she casts off her fastenings or weighs anchor and moves at all upon her way, with the intention of going on at once, although she be accidentally and compulsorily arrested and delayed almost at once. If the warranty be to sail from a certain port, or coast, or island, that is not satisfied by sailing from it with the purpose of immediate return, or going from one part of the coast or island to another. There are also some implied warranties; but by far the most important of these is the universal warranty of seaworthiness. Every person who proposes to insurers to insure his ship, engages and warrants that his ship is in every respect in a safe and suitable condition to encounter all common perils and dangers on the voyage or in the place where she is to be while under insurance. The insurers may expressly waive this warranty, but this is very seldom done; and wherever it exists, there it is a condition precedent to the obligation of the insurance; that is to say, if this warranty be not performed or complied with, the insurance never attaches. The insurance is equally avoided by unseaworthiness, although this was unknown, and indeed could not be known, to the insured.—What seaworthiness is, or requires, can never be exactly defined in its details by law, because the changes and improvements in navigation are continually introducing new things and making them necessary. In general, the vessel insured must be all that, according to the common usage among merchants, is requisite to enable that vessel to encounter the ordinary perils it must expect while insured. Seaworthiness is one thing for a long voyage, another for a short voyage, and still another if the ship is to remain in port. It requires reasonable soundness and strength in materials, and a full equipment of all appurtenances and implements which are necessary to the ship, with a proper master, officers, and crew, and proper papers. If the ship be seaworthy at the beginning, so that the policy attaches, the law may not be

quite settled as to the effect of a subsequent unseaworthiness. It certainly has no effect upon a previous loss; and we consider the better rule to be, that it only suspends but does not destroy the insurance. Thus if a ship loses her best bower anchor, this has no effect upon a previous loss, nor upon a loss that occurs before the anchor can be replaced. If the vessel reaches a port where she might replace the anchor, and does not, and sails and meets with a loss, nearly all agree that the insurers are discharged; but some authorities hold the insurers liable for a loss occurring during such an unseaworthiness, if the loss be not caused by it. If at a subsequent port she replaces her anchor, and afterward, being seaworthy, she meets with an injury, we hold that the insurers would be liable, although this may not be certain.—Another implied warranty is, that there shall be no false representations, and no concealment of material facts; for if there be either of these, the policy does not attach. In the law of insurance, that is a misrepresentation, which, however made, tends materially to obtain for the utterer a contract which otherwise would not be made, or better terms than would otherwise be granted. Concealment is the suppression of a material circumstance, for the same purpose. Such misrepresentation or concealment discharges the insurers, although made unintentionally and only through mistake; but it has not this effect if withdrawn before the policy is made, or if it ceases to be material before the risk begins. If the representation relate to the future, a future compliance with it is as necessary as a present compliance with a present representation. The insured is bound to communicate not only ascertained facts, but all intelligence, and even rumors, if they are such as may reasonably enter into the estimate of the risk; but he is not bound to disclose what are merely his own hopes or fears, nor such matters of general information or public notoriety as are likely to be as well known to one person as to another; nor any thing which the insurers already know; nor any thing expressly provided for in the policy. A substantial compliance with a representation is sufficient, although it be not so exact as would be required in the case of an express warranty.—As nothing prevents the parties from making what agreement they choose, they sometimes omit, or expressly except, certain risks; or the insured warrants against them, which comes to the same thing. When, as sometimes happens, causes mingle to produce a loss, some of which are insured against and some are not, it may be very difficult to determine whether the insurers are liable. There are many such cases. The general rule is: *Causa proxima, non remota spectatur*. But even then it becomes difficult to know what is a proximate cause, and what is a remote cause. Here also the general rule may be given; it is, that insurers are not liable for any effects of a peril against which they insure, excepting those which are the natural, direct, and immediate effects thereof. One way in which insur-

ers seek to guard against this question, is by having a long list of what are called memorandum articles inserted in their policy, or referred to in it. These are grain, hides, and other perishable things, which are likely to be injured somewhat, either by slight causes, or without external causes; and it is provided that the insurers shall not be answerable for these, unless there is a total loss, or a certain large loss, or unless the loss be caused by stranding; for in either of these events, it will be probable that the loss is caused by a peril insured against.—Another implied warranty of the insured is, that there shall be no deviation; and this is an important rule, and has caused much litigation. It means, primarily, that the ship shall go by the direct and usual course to the place whither she is bound. It means also, by construction and usage, not only that there shall be no departure from the proper course, but no unnecessary delay, or; more extensively, no material departure from or change in the risks insured against, not justified by a good cause. Nor need this change increase the risk, for the parties have a right to hold each other to their agreement. There may be deviation while a ship is in port, or where no particular voyage is indicated, the insurance being on time; and the rule concerning deviation, like nearly all those of the law of marine insurance, is equally in force in the lake and river navigation of this country as in its ocean commerce. The effect of deviation is to discharge the insurers altogether from all subsequent risks. If, when a deviation ceases, all subsequent risks are precisely the same as they would have been had the deviation not taken place, the obligation of the insurers might revive; but this can rarely be the case. The most usual deviation is still that which was originally the only one, viz., a departure from the proper course of the voyage; and the proper course is the usual course, or, in the absence of usage, the obviously direct and safe course. There are cases where a slight deviation discharges the insurers; but it must have some reality and effect. Delay in commencing or in prosecuting a voyage may be a deviation. Going into a port out of the natural and proper course is certainly one. Liberty is often given on the policy "to enter" such a port, or "touch at," or "stop and trade at," or otherwise as the parties may agree; but such a liberty is usually construed very strictly. A deviation does not discharge the insurers, unless it be voluntary. Any necessity, as for repairs or provisions, or to save life, or to avoid a peril, justifies so much deviation as it requires. A mere intent to deviate has not the effect of deviation. Thus, for example, if a vessel sails from New York, insured on a voyage to New Orleans, intending at a certain point in her course to bear away for Havana, and is lost before she bears away, the insurers are held.—We have already stated that the consideration for the contract of insurance is called the premium; and this is a small sum of money, for

which, in this country, the insured or his agent usually gives his note when the policy is made and delivered, which is called the premium note. This premium is never due in fact until it be earned by the risk, for insurance against which the premium is paid. If this risk never takes place, the promise to pay the premium cannot be enforced; and if it have been paid, the insurers must repay it. Hence it is always in the power of the insured to cancel the policy before the risk attaches, by refusing to put his property under that risk. But unless the voyage be abandoned, a notice of his wish to cancel the policy has no effect. If the whole risk attaches to the whole property for any time whatever, no part of the premium is returnable. If the risk attaches to a severable part of the property only, a proportional part only of the premium is earned, and the remainder is returnable. Clauses are sometimes inserted in policies defining certain contingencies upon which the premium is returnable in whole or in part.—The property insured should be described sufficiently to secure its identification; but the interest of the insured need not be described, as whether it be all, or half, or a quarter, or that of an owner, a mortgagee, or a factor. Insurance on a ship covers all the implements and appurtenants actually and properly used for her navigation, although not strictly necessary. An open policy on the ship does not cover the freight; but it is common to cover the freight by a valuation of the ship. One who owns both ship and cargo may insure his "freight," and thereby cover what his ship would earn by carrying for another owner that cargo for the same distance.—The insurers are never responsible for the acts of the insured, or for the direct and immediate consequences of those acts; but they may be for the consequences of the acts or omissions of the master and crew, although they are the servants of the owner, but not if their conduct was in compliance with the owner's orders or instructions. It may be stated as a universal rule, that the insurers are liable only for extraordinary risks; for the seaworthiness of the ship implies her competency to meet safely all ordinary risks. Hence they are not liable for any loss which shall be attributed to wear and tear, or ordinary breakage. So, too, insurers are never liable for losses which are the consequences of inherent defects or qualities of the property insured, unless these are made active and destructive by a peril insured against, as where hemp rots or lime takes fire from being wet by the effect of storm or wreck. If the losses occur by contraband trade, or a violation of the law of foreign countries, this, we have seen, does not discharge the insurers on the ground of illegality; but it does discharge them as a risk they never undertook, unless the insured had previously to the insurance informed them that the goods or ship would undergo this risk, or the insurers knew this otherwise.—American policies commonly enumerate the risks against which the insurance is made. They are

usually perils of the sea, fire, barratry, theft, piracy, arrests, and detentions. A general clause, "all other perils," is usually added, but is restricted by the enumeration. Of these perils, the first, "perils of the sea," is by far the most important, and would of itself include some of the others. It covers in general all loss or damage arising from extraordinary action of wind or sea, or from inevitable accidents arising from navigation. But no natural loss, as for example the destruction of a ship through leakage caused by worms, is a loss by a peril of the sea. Collision is a peril of the sea. The rule of the sea is, that when two ships collide, if neither be in fault, the loss rests where it falls. If one alone is in fault, the whole loss rests on him. If both are in fault, the common law courts let the loss rest where it falls; but the courts of admiralty divide the loss equally between the parties. For the loss a vessel suffers by collision, her insurers are answerable. It has been held that they were liable for what the vessel they insure had to pay because in fault; but the later and the better rule limits their liability to the loss actually sustained. To bring a loss within the clause of "theft or piracy," it is said that there must be violence, and that the thieves must not be the crew, unless they are in mutiny; but this is not certain, and it is now common to use the phrase "assailing thieves," in order to limit the liability of the insurers to a loss from violence from without the ship. What is barratry has been much disputed. It is an ancient maritime term, and may perhaps be best defined as any wrongful act of the master, officers, or crew, done against the owner. If it be a wrongful act, against him in fact, it may be barratry, although mistakenly intended for his benefit. But it must be against the owner of the ship, and is not barratry as against other parties if the act be done by the owner's command or with his consent. In American policies it is now common to add after the word "barratry" the words, "if the insured be not owner of the ship." The effect of this is, that ship owners are not insured against barratry, but shippers of goods are; and the reason is, that insurers are willing to insure shippers of goods against the misconduct of those they do not appoint, and cannot control, but are not willing to insure ship owners against the acts of their own servants.—The termini of the voyage must always be definitely stated (if the insurance be not on time), not only to determine whether there be a deviation, but also to show whether any loss that occurs takes place within the policy. It is important therefore to know precisely when the insurance begins and when it ceases. By the words usually inserted, "lost or not lost," the insurers make themselves responsible although the property be at that time wholly lost, provided the insured does not know it, or makes known all he knows about it. Insurance "at and from" a place begins when the property is there in a safe condition. Insurance "from"

a place begins when the ship sails. English and American insurers now usually insert a clause in all voyage policies, that the insurance continues "until the ship be arrived and moored 24 hours in safety." This means safety from the perils insured against, and not the local ones of the port or place, as unsafe mooring, &c.; as otherwise it could not cease while she lies there. The insurers are answerable if the loss occurs after the policy expires, provided it be the direct, immediate, and inevitable effect of an injury received at a time when the policy attaches, from a peril insured against.—The loss may be total or partial; and a total loss may be actual or constructive. An actually total loss occurs when the ship or goods are actually submerged, or destroyed by fire or some other peril, so that no part of them of any value survives and is recoverable. A constructive total loss, or, as it is sometimes called, a technical total loss, is one in which valuable portions of the property survive, but are transferred to the insurers by abandonment, so that the whole property passes out of the possession of the insured, and the insurers pay for the whole, and hold the salvage (or property saved) as their own. By the established usage of this country, confirmed by abundant adjudication, the insured has a right to abandon, and thus convert a partial loss into a total loss, whenever the partial loss exceeds one half of the value of the property insured. But our policies now generally, or always, contain the clause that there shall be abandonment only when the partial loss exceeds 50 per cent., estimated as a partial loss. This means, after a deduction of one third off. For it is one of the practical rules to which merchants have come, that in every case of partial loss, one third shall be allowed as the benefit conferred by the new materials of repair; or, in the common phrase, "one third off, new for old." Thus, if a new vessel sails to-day, and to-morrow loses her masts and rigging so as to require that all her top hamper should be replaced, and the insurers pay the cost of this, the owners gain nothing. But if the same ship, after spars and canvas are nearly worn out, meets with the same disaster, and new ones are supplied, and the insurers pay the cost, the insured gains nearly all that he receives, for he lost very little by the disaster. Merchants and insurers, instead of trying to determine the proportion in each case, wisely conclude that the average, one third off, meets all cases fairly. By applying this to the case of constructive total loss, it is plain that a partial loss, to justify abandonment, must be more than 75 per cent.; for one third of 75 (25) being taken off, leaves 50 per cent. (For the loss of a ship by the sale of the master, in a case of strict necessity, see SHIPPING.) Whether the property insured be ship or cargo, it is the universal rule, that a loss where any thing is saved cannot be made total, excepting by transfer of salvage by abandonment to the insurers; and the same rule applies to all claims, rights, or interests in, to, or about the property, re-

maining in or accruing to the insured. Thus, if the insured lose by jettison or otherwise so as to acquire a claim to general average contribution, this claim must be transferred; and if the insured have to pay a general average contribution caused by a loss insured against, the insurers must repay it. (See AVERAGE, and SHIPPING.) There is no especial form of abandonment; but it must be made by the insured without any unnecessary delay, immediately upon learning the loss, and in terms distinctly indicating the fact of their loss, and their transfer of all salvage by abandonment, and their claim for a total loss. If the abandonment be accepted, it binds the insurers; but if they refuse the acceptance, their refusal cannot impair the rights of the insured. II. INSURANCE AGAINST FIRE. The principles of fire insurance are the same with those of marine insurance, excepting so far as the nature of the property and of the risk causes a difference. It is only these differences that we need to present. Much the largest amount of insurance against fire in the United States is now done by mutual insurance companies; and these are so numerous, so well regulated by the statutes of the several states, and in general so well conducted, and the principle of paying only what the actual risk is worth is so well carried into effect, that no person is excusable for not protecting himself and his family or creditors against this loss. Marine insurance is usually effected through a broker; fire insurance usually by the party himself. He generally has to sign a formal application, and answer therein many questions; and the substantial truth of every answer would be taken as a condition precedent to any liability on the part of the insurers. It is common to state in the application, or policy itself, that certain risks are "hazardous," and a scale of premiums is sometimes given for different classes of property; and it is of extreme importance that the insured should not deceive the insurers on this point. But there must be a rational if not a liberal construction of all these rules. Thus, if "cotton in bales" is represented as particularly "hazardous," a policy would not be avoided by the fact that a person insured upon a store and goods had one or two bales there for retail. So if "storing" certain goods demands an extra premium, having a small quantity for home consumption, or even for sale, does not come within the meaning of this clause. If the insured propose to make any alteration in the premises insured, he should make this known to the insurers, and, if he can, obtain their leave in writing. But we apprehend that mere alterations, however expensive or important, do not of themselves avoid a policy, unless they are such that they increase the risk substantially. While the alterations are in progress, and a new risk exists from them, the underwriters are discharged from liability caused by a loss arising from this risk, but not, we think, if it arises from a cause wholly independent of the risk; and if the alterations are finished, and the

risk not altered, they do not affect the insurance. It is usual to provide in the policy, or by the rules of the company, for making necessary or proper repairs. We think, where this provision is not made, that the insured have by law a right to make them, without affecting the insurance. But the repairs must not increase the risk, as for example by the substitution of shingles for slates.—The law of warranty, of representation, and of concealment, is much the same in fire insurance as in marine insurance. But some questions have arisen as to what part of a description is a continuing warranty. If expressly prospective, as that water tanks shall be kept in an upper story, or a certain watch maintained, these of course are continuing promises, and a breach avoids or suspends the policy. So a description that the house is slated would be a continuing warranty that it should remain slated. But a statement that the house stands "500 feet from any other building," would not avoid the policy, if a neighbor should put up a building within 100 feet of the insured. There seems to be this difference between the two kinds of policies: a breach of warranty avoids a marine policy, however innocent the insured; but it seldom has this effect upon a fire policy, unless there be fraud or other default on the part of the insured. At the time of the insurance, the property must be in existence, and not then on fire, or in immediate danger from fire. Heat alone, however excessive, or however caused, or however destructive, does not make the insurers liable unless there be fire, or ignition. Hence, it is now settled that a loss by lightning is not a loss by fire, unless the property be lost by ignition caused by the lightning. But if there be a fire, usage and the law go very far in holding the insurers liable for the consequences of it. Thus, any loss caused by honest efforts to extinguish the fire, as by water poured upon it, or any loss sustained by removal of the insured goods from a peril of fire, or by the blowing up or tearing down of a building to arrest a fire, would fall on the insurers. But there must be an actual fire, near enough and dangerous enough to justify reasonable men in the measures which have resulted in the loss. While an explosion of or by gunpowder is a loss by fire, an explosion of or by steam has been held not to be so. Though the loss be caused by the negligence of the servants of the insured, the insurers are still held; and so they are if it be caused by his own negligence, unless that be so extreme and extraordinary as to raise a suspicion of, or rather imply, fraudulent intent. That the fire is caused by the insanity of the insured is no defence to the insurers.—Valuation is sometimes made in policies by stock companies upon chattels of uncertain value, as books, plate, or works of art; seldom by these companies on houses; and never upon any thing, so far as we know, by mutual companies, for the purpose of determining the amount to be paid in case of loss. If a loss happens, the insured is entitled only to actual indemnity; but a valua-

tion is required by the charters of most mutual companies, because they are commonly bound not to insure beyond a certain proportion of the value, and the valuation for this purpose is usually binding on both parties. Insurers against fire generally stipulate that they may rebuild or repair the premises insured, if they prefer this course to paying for the loss, and they frequently avail themselves of the right. In that case they are bound to put the premises in as good order as before. There is not in fire insurance any rule answering to the "one third off, new for old," in marine insurance; nor any usage of making a partial loss total by abandonment, although all insurers who pay a total loss are entitled to all salvage or remains. Nor is there any thing of general average known to fire insurance.—As it is deemed especially important, in fire insurance, to prevent insuring more than the value of the property, in order to guard against the temptation to burn it for the insurance, our policies generally provide in substance and effect that any previous insurance, not made known, shall avoid any subsequent policy; and the law is very strict in construing and applying this rule or provision. Some policies provide also that subsequent insurance, under certain circumstances, shall avoid the policy. In general, every one insured should study his policy, and be careful to comply with all its requirements; his ignorance of them being no excuse whatever for a neglect of them. III. INSURANCE AGAINST LOSS BY DEATH, or LIFE INSURANCE, as it is commonly called, is a much simpler contract, in many respects, than either of the preceding. It borrows their rules as far as they are applicable. There can be but one loss, and that is death; and therefore there is no partial loss, nor average, nor abandonment. The law of warranty, representation, and concealment is the same as in the other forms of insurance, but is of especial importance in this. The applicant must usually sign a paper containing a great variety of questions, to each of which he must give a specific answer. It may be useful to applicants to remember, that if they state any thing untruly, although innocently, it may and probably will avoid the insurance. Therefore, unless the fact is one of which the applicant is absolutely certain, it is prudent for him to say, "according to my best knowledge and belief," or to use other similar words, for then he will be bound only to be honest. Upon this point, it may be proper to state, that while the questions put are numerous and precise, sometimes almost ludicrously so, the facts stated and the questions arising are rationally construed by courts. Thus if to the question: "Have you ever spit blood?" the applicant answers: "Never," this must be false if he ever had a tooth drawn. But the policy is not avoided unless he has spit blood under circumstances to make it a symptom of one of the diseases about which it is the obvious intention of the insurers to inquire. So the warranty of good health does not mean perfect health, which no one has, but reasonably

good health, such as men ordinarily have who are not called diseased. In life insurance there are sometimes three parties: 1, the insurer; 2, the insured; 3, the life-insured, who takes the place of the property insured in the other forms of insurance. It is a universal rule, that every insured must have an interest in the thing insured. Every man has an interest in his own life, and may insure it; but he cannot insure the life of another, unless he has an interest in the life of the life-insured; and it must be a pecuniary interest. Thus one may insure the life of a creditor; so a sister may insure the life of a brother who supports her; and this rule applies not only to all kindred, but to all other cases where there is a real dependence, and a substantial pecuniary interest, although it be not legal or technical.—Life policies are assignable in law, and are often made for the purpose of assignment, as to secure a loan or the like. But if, as is generally the case, the matter of assignment is specially provided for by the policy, the rules prescribed must be carefully adhered to. Generally, a delivery or deposit of the policy, for the purpose of assignment, will have the effect of assignment without any writing. But delivery is necessary.—Certain places, and certain trades, are usually prohibited unless notice be given and an extra premium be paid. The exception against suicide has given rise to the important questions, whether the policy is avoided by suicide in delirium or by accident, as by taking poison through mistake. Much must depend upon the wording of the policies, and insurance companies try to make this clause very stringent. But most men die by their own acts, more or less directly, and we should say that the weight of authority as well as of reason would lead to the conclusion that the insurers were not discharged under the clause respecting suicide by any thing less than wilful suicide; and not by this if it were committed in a state of mind which destroyed responsibility.—The time of the death is very important; for if it occurs after the policy expires either by its own limitation or by default of payment of premium, the insurers are discharged. There may be no evidence of death beyond the fact that the life-insured is missing, and has not been heard from for a long time. It has been said, in England and in this country, and sanctioned by statutory provision in New York, that after 7 years of absence and silence there is a presumption of death; and it seems to be so as to all matters of probate and settlement of estate. We regard this, however, in all matters of life insurance, as a mere question of fact; and the parties alleging the fact of death must prove it as they can, either by presumptive or by direct evidence, or both. So, too, when the inference of death rests only on the presumption from absence and silence, there is still no presumption as to the moment of death, or whether it occurred on the first day, or the last, or on what intermediate day. It is also sometimes important to determine which of two persons died

first, as when both were on board a vessel which was certainly lost, but no one knows precisely how or when. Here, it used to be said that, in early life, the presumption of survivorship was in favor of the elder person; and in later life, in favor of the younger. But this only means that the presumption rests on the probability that the stronger outlives the weaker. We apprehend that there is no definite rule of presumption about this; but the fact must be determined, by the jury or other tribunal before whom it comes, upon all the evidence which is offered.—On one important point, there seems to be a radical difference between life insurance and marine or fire insurance. We have seen that in the two former, whenever insurers pay a total loss, they are entitled to all the interests and benefits which remain or result to the insured from or because of the thing insured; and they hold this as a kind of salvage. This rule used to be applied to life insurance also. Thus, in 1807, a creditor of William Pitt, who had insured a large sum on his life, and was paid his debt by parliament, sued the insurers on the policy; but it was held that the interest of the insured had ceased, and he was fully indemnified; and it seems to have been thought, that if the insurers paid the loss they would be entitled to the parliamentary provision, on the ground that they were subrogated to the rights of the insured. This case may be found in 9 East, 72, under the name of *Godsall vs. Boldero*, and is approved in many subsequent cases; and its doctrine is presented as “established doctrine” in 2 Smith’s “Leading Cases,” 157. But the insurance companies of England disregarded it from the beginning; and it has been wholly overthrown as law by the case of *Dally vs. the India and London Life Ins. Co.* (18 London Jurist, No. 935, and 15 Common Bench, 365), and the case of *Law vs. London Indisputable Life Policy Company* (19 Jurist, 178, and 1 Kay and J. 223), and also *Loomis vs. Eagle Ins. Co.* (6 Gray, 396). In some American life policies, there is however a provision, that, in case of loss, the insured creditor shall transfer to the insurers a portion of the debt equal to the amount they pay.

INTAGLIO (It. *intagliare*, to cut out), a stone or gem on which a figure is hollowed out so that the impression of it may be in relief. Seals are thus engraved. (See **GEM ENGRAVING**.)

INTEGRAL CALCULUS. See **CALCULUS**.

INTERCALARY (Lat. *inter*, between, and *calo*, to proclaim), a chronological term applied to a day, week, or month occasionally inserted among others of a series; as the 29th day added once in 4 years to the month of February.

INTERDICT, in the Roman Catholic church, an ecclesiastical censure, directed against particular persons or all the inhabitants of a specified place. It forbids the exercise of the ordinary acts of public worship. When an interdict was laid upon a town, district, or country, all the churches were closed, the bells were silent,

the sacraments, except infant baptism and extreme unction (and sometimes even these), were withheld, the rites of burial were not performed, and all the public ceremonies of religion were suspended. The censure was promulgated by a papal bull. The bishops, however, seem to have anciently exercised the right of publishing interdicts; for in 870 Ilincmar, bishop of Laon in France, issued one against a parish in his diocese. One of the earliest censures of this sort on record was imposed upon the city of Rouen in the 6th century on account of the murder of the archbishop Pretextatus by order of Queen Fredegonda. In 997 Gregory V. laid all France under an interdict because King Robert had married his own cousin, and the king was abandoned by most of his court. The same penalty was inflicted upon the kingdom of England under Stephen (1147) by Eugenius III., under John (1208) by Innocent III., under Henry VIII. (1535) with little effect by Paul III., and under Elizabeth (1587) by Sixtus V. Adrian IV. laid Rome under an interdict for the purpose of driving out Arnold of Brescia. Gregory IX. made use of the same weapon in his quarrel with the emperor Frederic II., and Paul V. in 1606 laid an interdict upon the republic of Venice in consequence of the passage of certain decrees relating to ecclesiastical matters. The government resisted the promulgation of the bull, and ordered the parochial clergy to continue their functions as usual. During the middle ages the interdict was a powerful engine of attack for the popes in their contests with sovereigns, as the popular dread of its effects was so great that kings were often forced by rebellions to submit to almost any conditions in order that it might be taken off. From the time of the reformation, local interdicts became rare; personal interdicts, which are the severest forms of ecclesiastical censure, are still imposed.

INTEREST, the compensation paid by the borrower to the lender, or by the debtor to the creditor, for the use of money. The money on which interest is paid is called the principal, the ratio of the annual interest to the principal the rate per cent., and the sum of the principal and interest the amount. A loan is at simple interest when the interest is paid as it falls due; it is at compound interest, when instead of being paid the interest is successively added to the principal at the periods when it falls due, and thus a new and increased principal is formed at every such period. In most countries the rate per cent. is established by law, and the loan of money at a higher rate than the legal one is called usury.

INTERLACHEN, or INTERLAKEN, a circle in the Swiss canton of Bern (pop. about 20,000), with a village of the same name (pop. nearly 1,100), celebrated for its charming situation in a little plain between the lake of Brienz and the lake of Thun, with a view of the Jungfrau, and in the vicinity of some of the most pictur-

esque scenery of Switzerland. It is the centre whence the Giesbach falls, the valleys of Lauterbrunnen with the Staubbach and Grindelwald with its glaciers, are usually explored by visitors, and is the favorite resort of a great number of foreigners in summer, especially English. The village consists of straggling whitewashed lodging houses, with trim green blinds, in front of which runs a magnificent avenue of huge walnut trees. Within a short distance of Interlachen is the old castle of Unspunnen, and the ancient village of Unterseen.

INTERMITTENT FEVER. See AGUE.

INTESTINE, the portion of the digestive apparatus situated below the stomach, divided into the small and large intestines. The former includes the duodenum, jejunum, and ileum; the latter the cæcum, colon, and rectum. Many of the details on these organs have been given in the articles ALIMENTARY CANAL, CÆCUM, COLON, and COMPARATIVE ANATOMY, and need not be here repeated. Next below the stomach comes the duodenum, the largest portion of the small intestine, about 12 inches long, receiving the ducts from the liver and pancreas, and furnished with numerous circular internal folds of mucous membrane (the *valvulæ conniventes*); above it is in contact with the liver and gall bladder, in front with the stomach and arch of the colon, and behind with the spinal column, right kidney, vena cava, aorta, and diaphragm; its arteries come chiefly from the superior mesenteric, and its nerves from the solar plexus. The jejunum and ileum, which follow, have no distinct line of separation, and may be described together as a canal 4 or 5 times as long as the body, arranged in numerous folds or convolutions, freely movable in front and on the sides, and attached to the mesentery behind; the upper portion is called jejunum from its being generally found empty. In front these are in relation with the omentum and the anterior abdominal wall, behind with the spine, and in various places with the large intestine; internally the structure resembles that of the duodenum, the valvulæ diminishing gradually from above downward; the mucous membrano is studded with glandular follicles, and contains also the patches of Peyer, the seat of lesion in typhoid fever. Of the large intestine the only portion to be alluded to is the rectum, the terminal portion, ending in the anal opening protected by sphincter muscles; it lies in the concavity of the sacrum, is cylindrical, mostly on the median line, and somewhat dilated at the lower end; its principal relations in both sexes are with the genito-urinary organs. Internally it presents longitudinal and parallel folds, with transverse semilunar wrinkles forming sacs in which fecal matter is often lodged for a long time; its mucous membrane possesses considerable absorbent powers, and may be used for introducing nutriment and medicine.—The common peristaltic movements of the intestinal canal depend upon the contractility of the muscular coat called into action by the stimulus of the contents, and

are not dependent upon cerebro-spinal nervous influence, though they may be modified through the spinal and sympathetic systems. In the duodenum and beginning of the jejunum are small branching clusters of follicles, the glands of Brunner, supposed to produce the intestinal juice (*succus entericus*), a colorless, viscid, alkaline secretion, exerting a solvent action on albuminous matters and converting starch into sugar. The follicles of Lieberkühn are simple open glandulæ, straight narrow cæca, very abundantly distributed through the entire length of the intestinal tube; they probably secrete mucus, intestinal juice, and fecal matters, according to their position. The proper muciparous glands of the small and large intestines are white, semi-transparent, epithelial structures, occurring in patches as large as a lentil, corresponding with the sebiparous glands of the skin. When the extent of these glandular structures of the intestine is considered, the beneficial action of purgative medicines, in hastening the removal of various morbid matters from the system by direct stimulation, may be easily understood.

INVERNESS (formerly Innerness), a royal parliamentary and municipal borough and seaport of Scotland, capital of Inverness-shire, situated on both sides of the river Ness, 9 m. from the Moray frith, near the N. entrance of the Caledonian canal, and 156½ m. N. W. from Edinburgh; pop. in 1851, 12,793. An iron suspension bridge connects the two sides of the river. Inverness is a town of great antiquity, and is considered the capital of the highlands. On an eminence to the S. E. of the town stood an ancient castle, in which it is supposed by some that Duncan was murdered by Macbeth. The castle was destroyed by Malcolm Canmore, who erected a new one, which was for several centuries used as a royal fortress, within whose walls a parliament was held during the reign of James I. In 1562 Queen Mary, on visiting Inverness on the occasion of the insurrection of the earl of Huntly, was refused admittance into the castle, and took up her residence in a house, part of which is still standing. On the site of this castle, which was blown up in 1746 by the troops of Prince Charles Stuart, stand now the court house and the county buildings. Cromwell erected a fort on the N. side of the town near the mouth of the Ness, which was demolished at the restoration, but part of the rampart still remains. Culloden moor, the scene of the battle which decided the fate of the pretender, is within 3 m. from the town.

INVERNESS-SHIRE, a county of Scotland, stretching diagonally across the mainland from sea to sea, between lat. 56° 40' and 57° 26' N., and including on the W. the island of Skye, several smaller islands, and most of the Outer Hebrides; area, 4,600 sq. m.; pop. in 1851, 96,500. Its S. W. shores are deeply indented by arms of the sea called lochs. The country is mountainous, well wooded, and generally fertile. The Monadhia (gray mountain), or Monagh Lea, and

the Benalder mountains are the principal ranges, each with an altitude of 3,000 feet. Ben Nevis, the loftiest hill in Britain, rises to a height of 4,406 feet; Mealfourvie, 3,060; Cairngorm, 4,050; and Tomnahurich, an isolated hill near Inverness, 1,984 feet. Veins of lead, silver, and ironstone have been discovered in this county, but no coal. The chief rivers are the Spey, Ness, Beauln, and Garry, all of which have valuable salmon fisheries. Lakes occupy 132 sq. m. of the area. The largest is Loch Ness, so deep that it never freezes. Many of these lakes are surrounded by scenery of the most picturesque description. The Gaelic language, excepting in the town of Inverness, is more prevalent than English. Agriculture is in a prosperous condition. Good wheat is raised round the Moray frith, but oats are the main crop. Tillage is, however, secondary to the raising of cattle and sheep.

INVERTEBRATA, a negative term in zoology, usefully employed by De Lamarck to designate animals destitute of a vertebral column or backbone. These are 3 out of the 4 great divisions of the animal kingdom, viz., articulates, mollusks, and radiates; the remaining division consists of the vertebrates, or those having an internal skeleton with a backbone for its central support, including man and other mammals, birds, reptiles, amphibians, and fishes. The articulates, characterized by a jointed body, contain insects, crustaceans (as crabs and lobsters), and worms; the mollusks are those generally denominated shell-bearing animals; the radiates include the echinoderms (or sea urchins, star fishes, and holothurians), the aculephs or jelly fishes, and the polyps (like *hydra*, *actinia*, and the coral animals). There is no homology or affinity between the structural type of the vertebrates and invertebrates, though there may be analogy; for instance, the head of an insect is not homologous with the head of a man, a bird, a reptile, or a fish, as it has no distinct brain cavity nor cranial vertebrae, yet its sense organs and other parts perform the same functions. Aristotle distinguished invertebrates from vertebrates, calling the former *avayua* (bloodless) and the latter *evayua* (having blood); Oken made the same distinction in his gut animals and flesh animals, and Ehrenberg in his *ganglioneura* and *myeloneura*; even De Lamarck was aware that in his *invertebrata* all the organs are contained in a single cavity, while in the *vertebrata* there are distinct cavities for the nervous system and the organs of vegetative life. De Lamarck divided the *invertebrata* into 2 orders and 12 classes, viz.: apathetic animals, with the 5 classes of *infusoria*, *polypi*, *radiaria*, *tunicata*, and *vermes*; and sensitive animals, with the 7 classes of insects, arachnids, *crustacea*, annelids, cirripeds, *conchifera*, and mollusks; all distinguished from *vertebrata*, or intelligent animals. The development of the embryo and the methods of reproduction in the invertebrates are different from those of the vertebrates. In the radiates the

germ surrounds the yolk like a crust, from which the more animated parts are derived, the alimentary canal being formed from the central mass; reproduction may also take place by buds or by transverse division in the polyps and jelly fishes, the latter also presenting the curious phenomena of alternate generation. In articulates the embryo is formed at the lower part of the yolk, with its dorsal surface toward the latter, so that the yolk is enveloped from below upward, the uniting suture being upon the back. In mollusks the yolk is introduced from the lower side of the animal as in vertebrates, but there is no upper cavity for the nervous system, as in the latter. It is thus evident that the term *invertebrata* is not equivalent in zoological precision to, and is far more comprehensive than, the vertebrate division; the oyster, the butterfly, the star fish, all invertebrates, have nothing in common but the absence of a vertebral column. Invertebrates appeared together in past geological ages, and at the same time some of the lower vertebrates (fishes); so that the idea of a gradual succession and elevation of animal types through radiates, mollusks, and articulates to vertebrates, as maintained in the "Vestiges of Creation," is almost entirely abandoned. Invertebrates include by far the most numerous and diversified forms in the animal kingdom; in them we find many important physiological questions answered, and by them we understand otherwise inexplicable problems of animal life and of its relations to changes in the earth's surface; in them we see a circulation of blood without a heart or without distinct vessels, respiration effected by a vascular integument, the nervous system reduced to its essential elements of ganglia with connecting cords, the external skeleton enclosing the muscles and organs, the plant-like mode of reproduction and of true hermaphroditism, and the multiplication of organs independently performing the same functions (as digestive sacs, gills, locomotive appendages, &c.). The different classes will be described more fully in their respective order. The whole subject is most learnedly treated by Prof. Owen in his "Lectures on the Invertebrate Animals."

INVESTITURE, the public delivery of a feud or fief by a lord to his vassal. Blackstone says: "Investitures, in their original rise, were probably intended to demonstrate, in conquered countries, the actual possession of the lord, and that he did not grant a bare litigious right, but a peaceable and firm possession. At a time when writing was seldom practised, a mere oral gift, at a distance from the spot that was given, was not likely to be long or accurately retained in the memory of bystanders who were very little interested in the grant." Investiture was performed by the presentation to the person invested of some symbol of authority and possession. In the Roman Catholic church, a bishop was invested by placing a crosier or pastoral staff in his hands. The early Christian emperors exercised the right of investiture of bishops, as

conferring on them the tenure of the fiefs or baronies attached to their sees. In France this practice of investiture by the temporal sovereign was introduced by Charlemagne, who after the bishop was consecrated placed the ring and crosier in his hands. The same right was conceded to the emperor Henry III. in 1047, and was repeatedly exercised by him. He claimed the prerogative of investiture at the consecration of the pope himself, and it is alleged by some writers that this prerogative had been conceded to Charlemagne by Pope Adrian I. in the 8th century. A few years later Pope Alexander II. issued a bull against investiture in general, which was subsequently revived by Gregory VII. against the pretensions of Henry IV. In the council of Lateran in 1080, Gregory declared that no bishop or abbot who submitted to lay investiture should be acknowledged as a prelate of the church. The contest on this question between the popes and the emperors continued into the succeeding century, when, by a concordat agreed upon at Worms between Calixtus II. and the emperor Henry V., the latter renounced for ever his claim to invest bishops with the ring and crosier. The French kings, however, long continued to exercise a similar power, and the contests between them and the popes on the subject at length resulted in a compromise by which the monarch relinquished the presentation of the symbols, but retained the right to confer investiture by a written instrument. In England the controversy ended in a similar compromise between Pascal II. and Henry I.

IO, in Greek mythology, the daughter of Inachus, the founder of the worship of Juno at Argos, or according to others of Piren or Jasus. She was beloved by Jupiter, who on account of Juno's jealousy changed her into a white heifer. Juno obtained from him the gift of the heifer, which she placed under the charge of Argus Panoptes in her grove at Mycenæ. Mercury, commissioned by Jupiter, was guided by a bird to Argus, slew him with a stone, and delivered Io. Thereupon Juno sent a gadfly, which tormented Io and pursued her in a state of frenzy over the whole earth, till at last she rested on the banks of the Nile, where she recovered the human form, bore a son to Jupiter named Epaphus, and, according to some accounts, introduced the worship of Isis, with whom she afterward became identified. The fullest narrative of her wanderings is in the *Prometheus* of Æschylus. As usually explained, Io represents the moon; Argus, the stars of heaven; Mercury, as the god of mists and clouds, is the Argus-slayer; and the wanderings of Io symbolize the phases of the moon.

IODINE (Gr. *ιωδης*, violet-colored), an elementary substance named from the color of its vapor, existing in various marine plants, the water of many mineral springs and of the ocean, the bittern of salt works, in sponges, corals, and in some rocks and minerals. It was discovered in manufacturing saltpetre by Courtois of Paris in 1812, and afterward examined and described

by several chemists, but more particularly by Gay-Lussac (*Annales de chimie*, vols. lxxxviii., xc., and xci). It is represented by the symbol I; its chemical equivalent is 126.36. In its preparation it crystallizes either from solution or by sublimation in scales like those of mica-ceous iron, and in regular crystals of elongated octahedrons with rhomboidal base. These are brittle, opaque, of bluish black color, and metallic lustre; their specific gravity is 4.95; they fuse at 225° F. into a dark liquid, and boil at 347°, giving off deep purple and violet vapors. Iodine is also volatile at common temperatures, and when exposed to the air diffuses an odor like that of chlorine, the vapor irritating the nostrils and exciting cough. This is among the heaviest of æriform bodies, its density being 8.7 times that of air. Alcohol and ether dissolve iodine freely; pure water takes up only about $\frac{1}{1000}$ of its weight of it, and thus acquires a yellowish or brown tinge. By adding nitrate or hydrochlorate of ammonia, common salt, or any of the iodides, to the water, its power of dissolving iodine is greatly increased, and the solution then takes a very deep brown color. Iodine gives a yellow stain to the skin, which soon disappears. Though resembling chlorine in its combinations and some of its qualities, it has not the property of bleaching, and its chemical affinities are weaker. Its remarkable property of imparting a deep blue color to a mass or solution of starch serves as a distinguishing test of extreme delicacy. The starch solution, if cold, will sensibly indicate the presence of iodine in solutions containing only $\frac{1}{1000000}$ of it. It is supposed that the iodine is merely mixed in a finely divided state with the starch. It must be free for the test to succeed; and to insure this, where the iodine may be in a state of an iodide, it is recommended to add to the solution a drop of sulphuric acid, and then a little vapor of chlorine, or instead of the chlorine a drop or two of nitric acid may be used.—Though iodine is detected in a multitude of organic bodies, principally those connected with the sea or in plants growing near the salt water, it is found in largest proportion in the *fuci* or common sea weeds, and other marine plants which grow at great depths. The *fucus palmatus* and *saccharinus* are especially rich in it. The preparation of the iodine of commerce is principally carried on at Glasgow, Scotland, at Donegal, Ireland, and at Cherbourg, France, to which places are brought the half vitrified ashes produced by burning the sea weeds collected on the coast. These ashes, called kelp, or on the continent *vaee*, being coarsely powdered, are digested some hours in water, and the solution is then drawn off upon a fresh portion, and from this upon a 3d, 4th, 5th, and it may be a 6th portion, until the liquor has attained a density of 1.257. The various soluble salts, including the iodides and bromides of all the alkalies, are thus taken up and separated from the earthy salts. The solution is then drawn off into broad evaporating pans, and concentrated to 60°

Twaddell, or sp. gr. 1.30. At this point the sulphate of soda and chloride of sodium begin to crystallize; they are ladled out as they separate from the solution, and placed so that the drainings from them run back into the pans. When they cease to appear, the liquor is left to repose and to deposit more chloride in the pans. It is then drawn off into coolers, and left for 5 days for the sulphates to crystallize, as also chloride of potassium. The liquor is then again evaporated in the pans, and at 68° T., or sp. gr. 1.34, deposits carbonate of soda, and more chloride of sodium and sulphate of soda. It is again run into a cooler to cause a further separation of chloride of potassium. The process is sometimes again repeated, and the liquor brought by evaporation to 74° T. After removing all the crystals that appear, there frequently remain in the solution some chlorides, hyposulphite of soda, and sulphuret of sodium. Strong sulphuric acid in the proportion of $\frac{1}{4}$ of the whole is then added, and after agitation the mixture is left to stand for 2 days. The sulphurous compounds are in this time decomposed, and sulphates are produced with liberation of sulphur in a free state, in sulphuretted hydrogen, and in sulphurous acid. The iodine is fixed by its combination with sodium, and, unless too much acid has been added, cannot be liberated except by oxygen. The lye is now poured into an iron still lined with lead, and when heated in a sand bath to 140°, a quantity of peroxide of manganese is introduced, and the still is luted and connected with its condensers. Iodine vapors come off at a temperature below the boiling point, and condense in the receivers. Particular care is required that the temperature does not exceed 212°, in which case the iodine is apt to combine with chlorine with loss. Cyanide of iodine often collects in white, prismatic crystals in the receiver furthest from the retort. A portion of iodine remains in the retort in combination with lead and sodium, which is recovered by first converting it into an iodide of copper by the addition of sulphate of copper, and, when this is separated by filtration, decomposing it by sulphuric acid and oxide of manganese, and collecting the vapor. The process above given is somewhat modified at different localities. A method has been proposed by Dr. Kemp to dispense with the burning of the plants, by which much iodine is volatilized and lost, and to crush the roots in which the largest proportion of iodine is concentrated, and set them to ferment; after which the iodine with other salts may be dissolved out by water acidulated with hydrochloric acid, and finally separated by proper reagents. It is also proposed to separate iodine from waters containing it in small quantity by passing these, acidulated with one part of sulphuric and two of nitric acid, through lampblack or ivory black, by which it is retained, and from which it may afterward be separated.—Iodine is useful as a test for starch, and also as an ingredient of various chemical reagents. Some of

these are of great importance in the photographic art. From the iodide of potassium is prepared the iodide of silver, which constitutes the sensitive film upon the plates. In medicine it is employed in different combinations and degrees of concentration to produce a variety of effects. In large doses it is poisonous, violently irritating the stomach. In frequent small doses it acts as a tonic, and especially as an absorbent of glandular tumors and enlargements. Its use is recommended in chronic rheumatism, scrofulous complaints, cutaneous eruptions, &c. It is administered in solution, and is also applied externally in the form of an ointment, and in iodine baths, about 3 grains of iodine being used to each gallon of water. The iodine is largely absorbed, but however administered it never accumulates in the system. Among the numerous combinations of iodine employed, the principal is the iodide of potassium, commonly called hydriodate of potassa, and this is often used for its influence in causing water to take up more iodine as a means of obtaining a stronger aqueous solution. Iodine is also combined with sulphur and with several of the metals, as iron, mercury, lead, &c., to produce special effects. Iodide of potassium is a powerful solvent of all the compounds of mercury and lead, and it has been found a valuable remedy in cases of poisoning by lead, and of tremors caused by mercury, the metals, as is supposed, being converted into soluble iodides, and in this condition removed from the system. Solutions of iodine also have been known to be antidotes against the bites of venomous serpents, especially of the crotales; and it has recently been found that the virulent poison known by the name of *wourali* in South America may be rendered innocuous by mixture with solution of iodine or iodide of potassium, so that it may be injected under the skin without danger. In case of poisoning by iodine, it is recommended to employ at once the stomach pump and make free use of amylaceous drinks, prepared from starch itself or flour or arrow root.—Iodine combines with oxygen to form two acids, iodic acid, IO_3 , and periodic, IO_7 , with hydrogen one, HI , called hydriodic acid. This closely resembles hydrochloric acid, as the oxygen acids correspond respectively to chloric and perchloric acids. The similarity in the combinations and properties of iodine, chlorine, and bromine suggest the possibility of their being modifications of one common element.

IONA, or IOLMKILL, called also I or Hy, a small island of the Inner Hebrides, situated in lat. $56^\circ 22' \text{ N.}$, long. $6^\circ 25' \text{ W.}$, 9 m. S. W. from Staffa, and separated from the island of Mull by a channel $1\frac{1}{2}$ m. in width, called the sound of I or of Iolmkill. It is embraced within the parish of Kilfinichen and county of Argyle, and is 3 m. long by $1\frac{1}{2}$ m. broad; pop. in 1851, 1,084. It has an irregular surface of moorland, rising in places to 400 feet in height. About $\frac{1}{2}$ of the island is cultivated, producing barley and potatoes. There is a small village, containing 3

churches and a school. The island was given by the Pictish king Bridius to St. Columba, who founded here a monastery which enjoyed for a long time a wide renown, and was one of the chief seats of learning in Europe. A paper entitled "A Visit to Iona, with some Account of its History," read before the Oxford architectural society in 1859, contains the following statement: "Iona was the chief seat of the horrors of druidism previously to the coming of St. Columba, about A. D. 564, who established a college on the island for the education and general improvement of the people. After his death the foundation passed through several phases, and, notwithstanding its isolated position, acquired great wealth, and increased in influence up to the time of the reformation. It continued under the influence of the Culdees until the beginning of the 13th century, when they were driven from their establishment by those from the south who acknowledged the authority of Rome. A nunnery established on the island about this time continued until 1543, when Anna Macdonald, the last prioress, died. The religious establishment was altogether broken up by the act of the Scotch parliament (1560) abolishing all religious houses. The island then passed into the hands of the McLeans, but is now the property of the duke of Argyle." —Iona is said at one time to have possessed as many as 360 stone crosses, resembling those of Ireland, but most of them were destroyed by Puritan zeal, and only 4 now remain. Sepulchral remains cover the island, both in the shape of cairns and of stone monuments of all kinds, Iona having been considered from time immemorial a sacred island, and numbers of Scotch, Irish, Norwegian, and even French kings having been buried there, the last of whom is said to have been the famous Macbeth. St. Oran's chapel, which is in the Norman style, is the most ancient of the existing ruins of Iona.

IONIA, a S. co. of the S. peninsula of Michigan, drained by Grand river; area, 576 sq. m.; pop. in 1850, 7,597. It has an undulating surface, about half of which is densely wooded. Red sandstone is quarried. The soil is rich, and much of it alluvial. The productions in 1850 were 76,035 bushels of Indian corn, 77,538 of wheat, 43,363 of oats, 53,555 of potatoes, 22,963 lbs. of wool, and 5,598 tons of hay. There were 3 churches, 1 newspaper office, and 2,610 pupils attending public schools. The Detroit and Milwaukee railroad passes through the county. Capital, Ionia.

IONIA, in ancient geography, a country on the W. coast of Asia Minor, extending from Phocæa in the N. to Miletus in the S., a direct distance of 800 stadia, but, from the sinuosities of the coast, making a seaboard of 3,430 stadia, or 400 English miles, and extending inland only a few miles. It thus comprised part of the seaboard of Lydia and Caria, comprehending the modern districts of Livas, Saruk-han, and Aidan, in Anatolia. The legendary account is that a portion of the great Ionian emigration from At-

tica, about the middle of the 11th century B. C., took its way to these shores, and under various chieftains conquered the country, and exterminated the male inhabitants. Eventually the Ionians obtained the 12 cities of Miletus, Myus, Priene, Ephesus, Lebedus, Colophon, Teos, Erythrae, Clazomenae, Phocaea, and Chios and Samos on the islands of the same name. Afterward, in 700 B. C., Smyrna was added. Each of these had a democratic constitution independent of the others, but common language and manners formed a bond of alliance between the colonies which answered all the purposes of a federation. Their mutual interests were discussed at regular meetings of delegates held at Panionium, on the N. slope of Mt. Mycale, where there was a temple to Neptune. The 12 cities took the general name of the Ionian Dodecapolis. Numerous colonies issued from the original 12, built towns along the coast, and in time extended to all parts of the Mediterranean and Euxine. Ionia early became the rival of Greece in civilization and in progress. Croesus the Lydian conquered the country. The Persians were its next masters. In 500 B. C. the Ionians revolted, but were again reduced to the Persian yoke until the battle of the Eurymedon in 469 secured their independence. In the period between the close of the Peloponnesian war (404) and the peace of Antalcidas (387), they sought the protection successively of Athens and Sparta, until the Persians again became masters of all the Greek cities of Asia. Alexander the Great reannexed the country to the empire of Macedon. The Romans, by classing these cities as provincial towns, deprived them of political importance; and the Turks in the 12th and 13th centuries extinguished what was left of their prosperity.

IONIAN ISLANDS, UNITED STATES OF THE, a republic under British protection, comprising 7 islands of the Grecian archipelago, viz.: Corfu, Cephalonia, Zante, Santa Maura, Ithaca or Theaki, Cerigo, and Paxo, with some smaller dependencies, lying between lat. 35° 48' and 39° 55' N., long. 18° 35' and 23° 18' E. The following table shows the area, population, and capital of the principal islands:

Islands.	Area in sq. m.	Pop. in 1855.	Capitals.
Corfu	227	75,532	Corfu.
Cephalonia	345	76,451	Argostoli.
Zante	161	88,627	Zante.
Santa Maura	180	20,043	Santa Maura.
Ithaca	44	11,343	Vathi.
Cerigo	116	13,007	Cerigo.
Paxo	26	5,025	Paxo.
Total	1,102	240,063	

Corfu is the seat of government of the whole confederacy. The aggregate population of the isles dependent upon the above in 1856 was 282, and the British garrison numbered 3,000. The islands are very mountainous, and mostly rise with rugged abruptness from the sea, affording, however, fine havens on their coasts. Mt. Aenos in Cephalonia is 5,306 feet in height, and in the

other islands there are hills ranging from 1,000 to 3,000 feet. There are of course no considerable rivers, but Corfu is watered by several large torrents. The geological formation is chiefly limestone, mixed with sandstone and gypsum. There are no active volcanoes. Most of the islands abound in fine natural scenery, and bear luxuriant vegetation. The soil is generally dry and calcareous, and about half the surface is arable. The climate is variable, but healthy. The spring is mild, the summer hot and dry, the autumn rainy, and the winter tempestuous. The sirocco is often felt, and N. winds blow violently during winter. Snow falls often, but does not last long except on the mountains. Earthquakes are not uncommon. Iron, coal, manganese, sulphate of soda, marl, clay, chalcodony, quartz, and gray marble are the most important minerals. The principal vegetable products are the olive, lemon, orange, and fig, grapes, currants, wheat, maize, barley, oats, flax, pulse, and cotton. The last is of very good quality. The celebrated currants of Zante are the fruit of a dwarf vine; the crop in that island alone is about 8,000,000 lbs. The valonia oak (*quercus agrifolia*) is valued for its acorns, beside being a beautiful tree. Madder grows wild, and the *cactus opuntia*, which furnishes the food of the cochineal insect, thrives in all the islands, but is little attended to. Experiments in the culture of indigo have succeeded well, but have been followed by no practical result. Farms are mostly small, and are let annually on shares. Sheep and goats are the only animals reared in considerable numbers. In 1858, 49,563 of the population were engaged in agriculture, 7,989 in manufactures, and 6,323 in commerce. The manufactures of these islands consist almost entirely of coarse cloths, earthenware, soap, salt, some silk and cotton fabrics, and flilgree work. Although the coasts abound with fish, the fisheries are not prosecuted systematically. A large coasting trade is carried on under the Ionian flag. The imports are sugar, coffee, drugs, raw and manufactured cotton and silk, wool and woollen cloth, glass, hardware, staves and hoops, iron, timber, wheat, Indian corn, rice, flour, cheese, salted fish, cattle, sheep, drugs, and tobacco; the exports are currants and olive oil, also wine, brandy, liqueurs, honey, wax, valonia acorns, soap, salt, and hare and lamb skins. The value of imports in 1856 was £849,210, and of exports £571,910. During the same year, the shipping which entered Ionian ports was of 504,696 tons burden, of which 172,233 was Austrian and 84,903 British; clearances 500,928 tons, of which 175,360 was Austrian and 90,504 British.—The natives of the Ionian islands are Greeks, with a considerable admixture of Albanian and Italian blood. Romaic is the language commonly spoken, and since 1852 has been adopted as the official tongue instead of the English. Italian is understood in most of the large towns, and is generally spoken by the higher classes. Some thousands of the islanders cross annually to the mainland to assist in the

labors of harvest, for which they receive payment in grain. Education flourishes, and no one is allowed to vote at elections unless he can read and write. In 1855 the 152 primary schools, exclusive of 37 private schools, contained 5,737 boys and 657 girls; the university had 76 students, and the minor college 79, beside 18 pupils at the ecclesiastical college. Each of the islands has an academy supported by the government, at which ancient Greek, Latin, modern languages, and mathematics are taught. There are 2,000 churches, with priests secular and regular sufficient to provide one pastor to every 50 souls. Four fifths of the population belong to the Greek church, under an exarch or primate, which office is held in rotation for 5 years by the archbishops of Corfu, Cephalonia, and Santa Maura. The rest of the people, excepting 5,000 Jews, mostly resident in Corfu, are Roman Catholics under an archbishop and one bishop. The Jews labor under several disabilities, both civil and religious. Excepting the bishops, the clergy are not paid from the revenue, but from ecclesiastical property under government management. The Greek clergy are poor and generally ignorant.—The government is vested in a lord high commissioner appointed by the British crown, and a parliament consisting of a senate and legislative assembly. The senate is composed of a president and secretary, who are chosen by the lord high commissioner, and 5 senators, who are chosen by the lower house. It has the executive power, and shares with the commissioner the control of the press. The legislative assembly consists of 40 members, 29 of whom are elected by the people and 11 appointed by the commissioner. They hold office for 5 years, and must belong to the rank of *synelites* or nobles. Each island moreover has a regent and council, partly chosen by popular vote and partly nominated by the commissioner and senate. The commissioner has the veto power on all measures, and may dissolve the assembly at any time. He also commands the British garrison and 4 regiments of local militia. A frigate and war steamer are stationed at Corfu. The republic bears the expense of this force to the extent of £25,000 per annum. The judiciary consists of a supreme court, and a civil, a criminal, and a commercial tribunal in each of the 7 chief islands, beside courts of justices of the peace. The revenue in 1856 amounted to £881,439, of which £154,385 was from customs duties, and the expenditures to £357,626, of which £25,000 was for payment of the military, £18,000 for the charges of the commissioner, £57,806 for the parliament and administration, and £10,432 for education. The islands are held by Britain as a military post auxiliary to Malta and Gibraltar.—In Grecian history these islands figured singly as Corcyra, Cephalonia, Zacynthus, Leucas, Ithaca, Cythera, and Paxos. In the 12th century they were taken by the kings of Sicily, and in the 14th fell under the jurisdiction of the Venetians, and so re-

mained till the fall of Venice threw them into the hands of the French by the treaty of Campo Formio. Russia and Turkey jointly expelled the French, and in 1800 erected them into the Septinsular republic, which, under the protection of Turkey, failed as an experiment of self-government. By a secret article in the treaty of Tilsit in 1807 they were given to the French; but being taken by the British during the wars from 1809 to 1814, they were secured to that power by the treaty of Paris, Nov. 9, 1815. Few events of importance have since occurred, excepting an insurrection in Cephalonia in 1848, which was suppressed. The islanders manifest little affection for the British rule, and for some years past there has been a powerful movement among them in favor of annexation to the kingdom of Greece; a resolution to that effect was passed in the legislative assembly at Corfu, July 2, 1857, which however was not carried into effect. In the same year an act passed the British parliament enabling subjects of the Ionian islands to hold naval and military commissions under the crown, from which they had previously been excluded. In Nov. 1858, Mr. Gladstone was sent as lord high commissioner extraordinary to the Ionian islands, with the purpose of hearing the complaints of the people; but nothing of importance seems to have resulted from his mission.

IOWA, one of the interior states of the American Union, and the 16th admitted under the federal constitution, situated between lat. 40° 20' and 43° 30' N., and long. 90° 12' and 96° 53' W.; extent N. and S. 208 m., and E. and W. about 300 m.; area, 50,914 sq. m., or 32,584,960 acres. It is bounded N. by Minnesota, E. by the Mississippi, which separates it from Wisconsin and Illinois, S. by Missouri and in part by Des Moines river, and W. by the Missouri and Big Sioux rivers, which separate it from Nebraska and Dacotah. The state is divided into 99 counties, viz.: Adair, Adams, Allamakee, Appanoose, Audubon, Benton, Black Hawk, Boone, Bremer, Butler, Buchanan, Buncombe, Buena Vista, Calhoun, Carroll, Cass, Cedar, Cerro Gordo, Cherokee, Chickasaw, Clarke, Clay, Clayton, Clinton, Crawford, Dallas, Davis, Decatur, Delaware, Des Moines, Dickinson, Dubuque, Emmet, Fayette, Floyd, Franklin, Fremont, Greene, Grundy, Guthrie, Hamilton, Hancock, Harrison, Hardin, Henry, Howard, Humboldt, Ida, Iowa, Jackson, Jasper, Jefferson, Johnson, Jones, Keokuk, Kossuth, Lee, Linn, Louisa, Lucas, Madison, Mahaska, Marion, Marshall, Mills, Mitchell, Monona, Monroe, Montgomery, Muscatine, O'Brien, Osceola, Page, Palo Alto, Plymouth, Pocahontas, Polk, Potawatamie, Poweshiek, Ringgold, Sac, Scott, Shelby, Sioux, Story, Tama, Taylor, Union, Van Buren, Wapello, Warren, Washington, Wayne, Webster, Winnebago, Winneshiek, Woodbury, Worth, Wright. Des Moines (late Fort Des Moines) is the state capital. The other principal cities and towns are: on the Iowa river, Iowa City, formerly the capital; on the Missis-

shippi, Dubuque, Davenport, Muscatine, Burlington, Fort Madison, and Keokuk; in the interior, Mt. Pleasant, Fairfield, Ottumwa, Oskaloosa, Marion, Anamosa, Cedar Rapids, Cedar Falls, Waterloo, &c.; and on the Missouri, Council Bluffs City, Sioux City, &c.—The following table exhibits the population of Iowa according to the U. S. censuses of 1840 and 1850, and the state censuses of subsequent years:

Years.	White.	Color'd.	Total.
1840.....	42,024	188	43,112
1850.....	191,881	833	192,714
1851.....	.....	.....	204,775
1852.....	227,773	861	228,634
1854.....	325,202	450	325,652
1856.....	519,146	271	519,417
1859.....	.....	.....	633,549

The population of the state in 1850 entitled it under the federal law to two representatives in congress. Of the white population in that year, 100,887 were males and 90,994 females; and of the colored, 165 males and 168 females. Families, 33,517; dwellings, 32,962. Density of population, 3.78 to the square mile; proportion to that of the whole Union, 0.83 per cent. Deaf and dumb, 59; blind, 50; insane, 42; idiotic, 94. Of the total population, 110,782 were under 20 years of age, 80,353 between 20 and 70, 1,024 between 70 and 100, 1 over 100, and 54 unknown. Born in Iowa, 50,380; in other states, 120,240; in foreign countries, 21,232; in parts unknown, 362. Of those born in other states there were from Ohio 30,713, Indiana 19,925, Pennsylvania 14,744, Kentucky 8,994, New York 8,134, Virginia 7,861, Illinois 7,247, Tennessee 4,274, Missouri 3,807; and of the foreign population, 9,734 were British, 7,253 Germans, 1,756 British American, 382 French, 361 Norwegians, and 231 Swedes. The number of persons born in Iowa and resident in other states was 6,358. The occupations of 49,315 males over 15 years of age are returned as follows: employed in commerce, trade, manufactures, mechanic arts, and mining, 9,255; in agriculture, 32,779; in labor not agricultural, 5,392; in the army, 71; in sea and river navigation, 163; in law, medicine, and divinity, 1,077; in other pursuits requiring education, 425; in government civil service, 103; in domestic service, 10; and in other pursuits, 40. Births in 1849-'50, 5,099; marriages, 1,824; deaths, 2,044. Of a total of 120,498 returned as engaged in industrial pursuits in 1856, 63,634 were farmers, 15,258 laborers, 23,202 manufacturers and artisans, 260 miners, 2,786 merchants, 1,163 traders, 1,105 physicians, 658 lawyers, 643 clergymen, 822 teachers, 1,486 clerks, 256 printers, 48 editors, 124 bankers, and 4,053 otherwise occupied. Of the population in 1859, 332,806 were males and 300,743 females; deaf and dumb, 301; blind, 190; insane, 168; idiotic, 283; voters, 136,457; aliens, 16,457; liable to military duty, 116,084; dwellings, 104,785; density of population, 12.22 to the square mile.—Beside the great rivers which bound it, the Mississippi on the east and the Missouri on the

west, Iowa has a large number of interior water courses, many navigable, and others of less dimensions, but supplying abundant hydraulic power. All the streams of Iowa flow into one or other of the great boundary rivers. The Mississippi receives the Des Moines, the Chequamegon or Skunk, the Iowa and its affluent the Red Cedar, the Wapsipicon, the Turkey, the Upper Iowa, &c., all of which have S. E. courses, and generally run parallel with each other. The rivers flowing to the Missouri are short and of small volume, and scarcely compare with the smallest class flowing to the Mississippi. The Big Sioux makes a portion of the W. boundary. The Chariton, Grand, Platte, Nodaway, and Nashabatonka rise in the S. of Iowa, pass into Missouri, and join the Missouri river in its course through that state. The surface of Iowa is generally undulating, and forms a country of unrivalled beauty. It has no mountains nor even high hills; yet on the margins of the rivers there are frequent bluffs or calcareous strata intersected by ravines. These bluffs are generally from 40 to 130 feet high, and are the breastwork of table-lands which sweep away from them in gentle undulations. The S. portion of the state is the most picturesque, abounding with grassy lawns and verdant plains, interspersed with groves and meandering rivulets, and intersected by the larger rivers which flow to the Mississippi or by the numerous affluents of the Missouri. Portions of the N. part partake more of the bold and striking in scenery; the surface is more elevated, and hills and mounds are not uncommon, their tops covered with towering oaks; and the rivers tumble over precipitous ledges of craggy rocks to the lower plains. The N. E. section is a rich mineral region, abounding in lead ore and various other metals, but nevertheless contains much excellent land. The unique and admirably diversified prairies of Iowa are, however, its most distinguishing feature. These natural meadows are covered with a rich coating of coarse grass, forming excellent pasturage, and are not unfrequently interspersed with hazel thickets and fragrant shrubs, and in the season of flowers are decorated with a brilliant garniture of honeysuckles, jessamines, wild roses, and violets.—A geological survey of the state of Iowa is in progress under the direction of Prof. James Hall, the chemical and mineralogical department being conducted by Mr. J. D. Whitney. A report in 2 vols. 8vo. was published in 1858-'9, which presents the general arrangement of the formations, with details of their fossils and economical importance. They belong exclusively to the class of paleozoic rocks, their range in the geological column being from the Potsdam sandstone to the coal measures, inclusive. The latter formation occupies the S. and W. portion of the state, and reaches within a few miles at its S. E. corner of the Mississippi river, from which it is separated by a belt of about 20 m., over which the carboniferous limestone is spread out. This limestone outcrop thence extends diagonally

nally across the state to the extreme N.W. corner. Toward the N. E. lower formations continue to appear in succession, and stretch in long parallel belts N. W. and S. E. The course of the rivers, as they descend from the N. border of the state to the Mississippi, is along the range of these formations; and it is remarkable how each river keeps almost exclusively along the same geological belt for nearly 200 m. The successive belts are thus designated by Prof. Hall, advancing in the descending series from the coal measures and the underlying carboniferous limestone toward the N. E.: the Hamilton and Chemung groups of the devonian series, the Leclaire and Niagara limestones of the upper silurian, the Hudson river shales, Galena limestone, Trenton limestone, St. Peter's sandstone, and Potsdam sandstone of the lower silurian. The last occupy the N. E. corner of the state. The coal measures are regarded as the most permanent source of mineral wealth, though the lead mines in the Galena limestone have attracted the earliest and greatest attention, and have so far been the most important in the value of their productions. Their aggregate thickness in the S. part of the state is less than 500 feet, and in this are found several workable beds of bituminous coal, one of which is sometimes 7 feet thick. The formation thins out as it spreads over the carboniferous limestone, and in this are found several outlying shallow basins of small extent. They are also met with beyond the limits of this rock, scattered in the depressions of the devonian, and even of the silurian series, and resting unconformably upon the upturned edges of these lower formations. Along the Mississippi river, between Davenport and Muscatine, a deposit of this character stretches 20 m. up and down the river, and not more than 3 m. back from it. This is the extension on the Iowa side of the Illinois coal field, the Mississippi river having completely by its denudation separated this marginal portion from the main body. The thickness of this isolated group of coal measures is not more than about 70 feet. It contains one coal bed which is identified as the lowest workable coal of the series. It is of no great importance, being only about 2½ feet thick. A few yards beneath it is a bed of carbonaceous slate, which sometimes presents a seam of cannel coal a foot thick. The lead mines are in the belt occupied by the Galena limestone. This tract reaches the Mississippi river at Dubuque, and lies along the valley of Turkey river toward the N. W.; but the only mines that have been worked in it are near the Mississippi. The ore is chiefly found in vertical crevices which are traced in E. and W. lines with remarkable regularity. They are congregated in great number in the immediate vicinity of Dubuque, and from the report of the state geologists it appears that no district in the Mississippi valley has produced so large an amount of ore for its extent as this tract of 12 to 15 sq. m. As the crevices in the limestone are followed in the course of mining, they are

frequently found to expand into what are called openings and large caves several hundred feet in length. The walls of these are incrustated with the sulphuret of lead, a single cave sometimes furnishing several million pounds. The depth of the mines is limited to the thickness of the Galena limestone, which seldom reaches 200 feet. In the blue limestone which underlies it, the crevices either close up or are unproductive. The yield of ore is very irregular, and the same mines rarely continue to be worked for even a few years. (See LEAD.) Iowa has also an abundance of iron ore of the best quality; and there are many other minerals not less valuable in an economical point of view. Building stone of the best description, various clays, gypsum, &c., sufficient for all present or prospective requirements, are found.—The soils of Iowa are generally excellent, and no state of the Union has a less amount of inferior land. The valleys of the Red Cedar, Iowa, and Des Moines, as high as lat. 42° 30' N., present a body of arable land, which taken as a whole, for richness in organic elements, for amount of saline matter, and due admixture of earthy silicates, affords a combination that belongs only to the most fertile upland plains. North of this, the best agricultural region of the state, the lands are of an inferior character, but still not unprofitable, and the lower grounds are either wet and marshy or filled with numerous ponds, and entirely destitute of timber.—The climate of Iowa is moderate, and highly favorable for agricultural operations. As a general rule the peach blossoms in mid April, and wheat ripens early in August. The winters, however, are severe from the prevalence of N. and N. W. winds, which sweep over the level prairies without obstruction. In summer the winds are from the W. and S., and, being in continual motion, greatly relieve the heats of that season. The mean temperature of the year is about 51° F.—in spring 50½°, in summer 73°, in autumn 53°, and in winter 26°; and the amount of rain fall is 50½ inches—in spring 15, in summer 16, in autumn 14½, and in winter 5 inches. In regard to salubrity, Iowa is classed among the most healthy countries of the world, a fact to be attributed to the excellent drainage furnished by its rolling surface. The exceptions to this condition are very rare.—The natural growths of Iowa are similar to those of the whole middle zone of the Union. North of lat. 42° timber is comparatively scarce, but south of that line and along the river the country is well wooded. Ash, elm, sugar and white maple, and cottonwood grow in the river bottoms; and in other localities are found poplar, oak, hickory, walnut, basswood, &c. In the N. there is some pine timber. "Sometimes the woodland extends continuously along the Mississippi for miles; again it stretches in a wide belt far off into the country, marking the course of some tributary stream; and sometimes in vast groves, several miles in extent, standing alone, like islands in the wilderness of grass and flowers." Among fruit trees, the

apple and pear attain the highest perfection. The peach tree also grows luxuriantly. The wild plum, grape, and gooseberry are indigenous. For the cultivation of the cereals no other part of the country surpasses this state; it is also favorable both in climate and soil for the castor oil plant, flax, tobacco, &c. Potatoes are also a favorite staple. According to the state census of 1859, Iowa contained 3,109,436 acres of improved, and 7,335,657 of unimproved land; there were 779,909 acres of wheat, 315,572 of oats, 986,096 of Indian corn, 34,031 of potatoes, 172,362 of meadow, 80,205 of Hungarian grass, 5,606 of sorghum, and 23,310 of orchard. The principal agricultural products consisted of 3,293,253 bushels of wheat, 1,703,760 of oats, 23,366,684 of Indian corn, 1,497,204 of potatoes, and 48,363 of grass seed; 433,603 tons of hay, and 114,036 of Hungarian grass; 416,774 galls. of molasses manufactured from sorghum; 9,432,219 lbs. of butter, 778,783 of cheese, and 627,860 of wool; value of orchard products, \$118,306. Value of hogs sold during 1853, \$2,111,425, and of cattle \$2,950,187; value of domestic manufactures, \$679,238. The total value of agricultural products in 1840 was \$688,308, and in 1850, \$8,800,997. In 1850 Iowa contained 522 establishments engaged in general manufactures, the mechanic arts, and mining, employing a capital of \$1,292,875. The cost of raw materials consumed in the census year was \$2,356,881; the number of hands employed was 1,707, viz., 1,687 males and 20 females; the cost of labor for the year was \$473,016; and the value of goods produced was \$3,551,783. In 1840 the total products were valued at \$457,734, and in 1859 at \$2,764,962.—On Nov. 30, 1858, the total length of completed railroad within the state was 340 m., which, to that date and including a considerable mileage partially constructed, had cost \$11,260,169. The following table exhibits the total length of the several lines, the mileage completed, and the cost of each work at the date above referred to:

Railroads.	Total miles.	Miles completed.	Cost.
1. Burlington and Missouri.....	276	52	\$1,500,000
2. Chicago, Iowa, and Nebraska.....	81	81	1,500,251
3. Dubuque and Pacific.....	319	50 }	2,107,144
Tête des Morts branch.....	104		
4. Dubuque South-Western.....	81	..	....
5. Iowa Central Air Line.....	339	..	....
6. Iowa Southern Tier.....	245	..	....
7. Keokuk and Fort Des Moines.....	140	33½	1,052,375
8. Keokuk, Mt. Pleasant, & Muscatine.....	65½	11	212,399
9. Mississippi and Missouri.....	312	55 }	4,195,000
Muscatine branch.....	12½	12½	
Oscalosa branch.....	94½	40 }	
10. Platte River Air Line.....	273	..	....

All these, except the Keokuk, Mt. Pleasant, and Muscatine road, are E. and W. lines; but Iowa will eventually have several N. and S. roads, which will connect it on the one hand with St. Louis and the south, and on the other hand with St. Paul and other towns of Minnesota. To aid in the construction of the lines Nos. 1, 3, 5, and 9, congress has granted to the several companies alternate sections of land for 6 m. on each side

of their route, being equivalent to 3,840 acres per mile. The Des Moines river improvement company have also a similar grant.—Iowa has no direct foreign commerce; but its trade with the Atlantic and gulf ports and the interior is comparatively extensive. The exports consist wholly of the products of agriculture and mines, and the imports of eastern and foreign manufactures, groceries, &c. The shipping ports are Keokuk, Fort Madison, Burlington, Muscatine, Davenport, Clinton, Bellevue, Dubuque, &c.; and at all of these places an active trade is also carried on with the interior, with which they are connected to a large extent by river steamboat routes and by railroad; and railroads from the east terminate on the opposite bank of the river, giving them access to the lakes and Atlantic seaboard.—The present constitution of Iowa was adopted in convention, March 5, 1857. It grants the right of voting to every male citizen of the United States, who has resided in the state 6 months and in the county 60 days. All elections by the people are by ballot; and the general election is held on the 2d Tuesday in October. The legislature consists of a senate of not more than 50 (now 43) members, elected for 4 years, half biennially, and a house of not more than 100 (now 86) members elected biennially. Senators must be 25 and representatives 21 years of age, and otherwise must have the qualifications of voters. In all elections by the legislature votes are given *viva voce*. The legislature meets on the 2d Monday of January biennially (even years). The governor and lieutenant-governor are chosen by a plurality of votes, hold office for two years, and the governor until his successor is elected and qualified. Both must be at least 30 years of age, and have been citizens and residents for two years next preceding election. The salary of the governor is \$2,000 per annum. The secretary of state, the auditor of public accounts, and the treasurer are elected by the people for two years, and have each a salary of \$1,500 per annum. The other state officers are the warden of the penitentiary (salary \$400), the secretary of the board of education (salary \$1,500), the commissioner of the Des Moines river improvement (salary \$1,000), and the registrar of the state land office (salary \$1,000). The state librarian has a salary of \$150. The judicial power is vested in a supreme court, district courts, and such other courts, inferior to the supreme court, as the legislature may establish. The supreme court, with appellate jurisdiction only in chancery cases, consists of 3 judges elected by the people for 6 years, one every second year, and the one having the shortest time to serve is chief justice. Judges of the district court are elected in single districts (of which there are now 11) for 4 years. The salary of supreme court judges is \$2,000, and of district judges \$1,200 per annum. A district attorney is elected in each judicial district for 4 years. Among the general provisions of the constitution are the fol-

lowing: the credit of the state shall not be given for any purpose; deficits in the revenue may be made up by borrowing money, but the sum not to exceed \$250,000 at any one time; debt may be contracted to repel invasion or suppress insurrection; no corporation shall be created by special law; stockholders in banks shall be individually liable to double the amount of the stock, and billholders shall have preference over other creditors; suspension of specie payment shall not be permitted; no new county shall be made of less than 432 square miles, nor shall any existing county be reduced below that size; no lease of agricultural lands shall be for more than 20 years; aliens, residents of the state, may hold and transmit real estate; imprisonment for debt is abolished, except in cases of fraud; parties in suit may be witnesses; duellists are disqualified from holding any office; the legislature is prohibited from granting divorces, authorizing lotteries, &c. The revenue of the state is derived chiefly from taxes upon real and personal property. The valuation of taxable property in 1847 was \$11,680,125; in 1850, \$22,623,334; in 1853, \$49,540,304; in 1856, \$164,394,413; and in 1857, \$240,044,534. The difference between the amounts for 1847 and 1857 shows the increase of wealth for the intervening 10 years. In 1856 the taxes assessed amounted to \$196,243. The total revenue for the year ending Oct. 31, 1857, including balance of previous year, amounted to \$255,327, and the disbursements to \$241,145. The funded debt of the state, Nov. 1, 1857, was \$122,295, and there were auditor's warrants then unpaid amounting to \$155,003. The principal institutions supported by the state are, the asylums for the deaf and dumb and the blind at Iowa City, the asylum for the insane at Mt. Pleasant, and the state penitentiary at Fort Madison. In the latter named institution there were on Sept. 30, 1857, 47 convicts (46 males and 1 female), whose labor is leased to contractors at 35 cents a day.—In 1850 there were 207 churches in Iowa, with accommodation for 43,529 persons, and valued at \$177,425. Of these, 23 were Baptist churches, 11 Christian, 14 Congregational, 5 Episcopal, 5 Friends', 4 German Reformed, 5 Lutheran, 76 Methodist, 3 Moravian, 38 Presbyterian, 18 Roman Catholic, 3 Union, 1 Universalist, and 1 other. No later general church statistics are furnished by the state censuses. The common schools of the state are supported partly from the proceeds of the school fund, partly by legislative appropriations, and partly by district taxation. They are supervised by a board of education, composed of one member elected from each judicial district for 4 years, one half biennially, of which the governor and lieutenant-governor are *ex officio* members, and the latter is president. This board makes all needful rules and regulations in regard to common schools and educational institutions. All lands granted by the United States for schools, the 500,000 acres

granted by congress to new states, all escheats, the percentage of sales of U. S. lands in the state, moneys paid for exemption from military duties, and fines for breach of penal laws, are devoted to the support of common schools, and constitute the school fund of the state, which in 1854 amounted to about \$1,000,000, and in 1857 nominally to \$2,030,544. The proceeds of this fund are divided as the legislature may direct in proportion to the number of children between 5 and 21 years of age. In March, 1857, \$111,840 was so apportioned. By the census of 1850 there were in Iowa 775 schools (including 2 colleges and 33 academies and private schools), with 878 teachers, 30,767 scholars, and an annual income of \$61,472; number of white children between the ages of 5 and 20, 76,363; number who attended school during the year, as returned by families, 35,473; number of persons over 20 years of age unable to read and write, 8,153. For the year ending Oct. 31, 1857, there were reported 2,708 district schools, 195,285 children between the ages of 5 and 21 (by the census of 1859, 230,646), and 79,672 pupils in school; teachers employed, 1,572 male and 1,424 female, who were paid \$126,358 from the teachers' fund, and \$71,785 from private subscription. The census of 1859 returns 28 colleges and universities, with 2,188 students. The principal collegiate institutions are: Des Moines college at Des Moines, founded in 1852; the Baptist university at Burlington, 1853; Alexander college at Dubuque, 1853; the Wesleyan university at Mt. Pleasant, 1854; the state university at Iowa City, 1855; and the medical school, a department of the state university, at Keokuk, 1850. The number of newspapers and periodicals published in Iowa in 1850 was 29, circulating 23,000 copies, or annually 1,512,800; and in the same year there were in the state 32 libraries (exclusive of private libraries), which contained 5,790 volumes.—Iowa derives its name from the river so called, and was originally a part of the vast territories included in Louisiana. The first settlement of whites within the present limits of the state was made by Julien Dubuque, a Canadian Frenchman, who in 1788 obtained a grant of a large tract, including the present city of Dubuque and the rich mineral lands in its vicinity. Here he built a small fort, and carried on the mining of lead and trade with the Indians until his death in 1810. In 1803 Louisiana was ceded to the United States; and in 1805 the whole territory was divided into the two governments of Orleans and Louisiana. In 1812 the name of the latter was changed to Missouri, and until 1821 included all the country N. of the present state of Louisiana. In 1834 Iowa was placed under the jurisdiction of Michigan, and in 1837 under that of Wisconsin. It was not however until 1833 that any steps were taken toward its further settlement. In the spring of that year several companies of Americans from Illinois and other states settled in the vicinity of Burlington; and at a later period settlements

were made at other points along the Mississippi. On June 12, 1838, Iowa was erected into a separate territory; and on July 4 ensuing the new government was formally installed at Burlington. Under its territorial organization Iowa included all the country N. of Missouri, between the Mississippi and the Missouri and to the British line, and consequently the greater part of the present state of Minnesota and the whole of Dacotah territory, with an area of 194,603 sq. m. In 1839 the government removed to Iowa City. In 1844 a state constitution was formed, and a petition sent to congress for admission into the Union. This was not granted on account of the constitutional limits assumed; and by an act of March 3, 1845, congress defined the boundaries that would be acceptable. The next year the proposed boundaries were approved by a convention assembled for the purpose; and on Dec. 28, 1846, Iowa was admitted into the Union.

IOWA. I. An E. co. of Iowa, intersected by the river of the same name and the N. fork of English river; area, 576 sq. m.; pop. in 1859, 7,098. It has an undulating and well wooded surface, and a fertile soil. The productions in 1859 were 342,399 bushels of Indian corn, 31,764 of wheat, 14,412 of oats, 21,826 of potatoes, 98,207 lbs. of butter, and 5,826 tons of hay. Capital, Marengo. II. A S. W. co. of Wisconsin, bounded N. by Wisconsin river, and drained by the branches of the Pekatonica; area, 720 sq. m.; pop. in 1855, 15,202. The surface is irregular and thinly timbered. Lead is abundant, and copper and zinc are also found. In 1850 the productions were 81,108 bushels of Indian corn, 50,747 of wheat, 109,875 of oats, 29,039 of potatoes, and 53,090 lbs. of butter. There were 13 churches, and 1,664 pupils attending public schools. Capital, Mineral Point.

IOWA, a river of the state of the same name, rising in Hancock co. in the N. part of the state, and flowing in a generally S. E. direction to the Mississippi, which it joins in Louisa co., 35 m. above Burlington. It is about 300 m. long, and is navigable by small steamboats to Iowa City, a distance of 80 m.

IOWA CITY, the capital of Johnson co., Iowa; and from 1839 to 1854 the seat of the territorial and state government, situated on the left bank of the Iowa river, 80 m. from its mouth, and 55 m. by the Chicago and Rock Island railroad W. from Davenport; pop. in 1850, 2,262; in 1856, 6,316. The city is pleasantly built on a succession of plateaus, rising one above another from the river banks, which are here high. The first plateau is laid out as a public promenade, and the third, which is about 80 feet higher than the first, is crowned by a handsome Doric edifice 120 feet long and 60 feet wide, of a beautifully marked stone quarried in the vicinity called "bird's-eye marble." This building was originally intended for the state capitol, but, on the removal of the seat of government to Des Moines, was appropriated to the state university. The county

offices and court house are the other principal public buildings. There are several flouring mills in operation, and the river furnishes motive power for various other manufactories. The city contains excellent schools and 2 or 3 newspaper offices. In 1855 it had 8 churches (1 Baptist, 1 Episcopal, 2 Methodist, 2 Presbyterian, 1 Roman Catholic, and 1 Universalist). The state university, founded in 1855, has 4 professors and a library of 200 volumes, and, beside a medical department at Keokuk, has branches at Fairfield and Dubuque. Iowa City is also the seat of asylums for the blind and the deaf and dumb, and of a female collegiate institute founded in 1853 under the auspices of the order of odd fellows. The Iowa river is navigable to this point by steamboats. The Chicago and Rock Island railroad has been completed from Chicago to Iowa City, and is in progress as far as Council Bluffs.

IPECACUANHA, a name given by the aborigines of Brazil to various roots which possess emetic properties. The root thus designated in the pharmacopœias does not, however, appear to be one of these, but of the *cephælis ipecacuanha*, called *pooya* in Brazil, a small plant of the natural order *rubiacæ*, sub-order *cinchonacæ*. It grows in the thick and shady woods of Brazil and New Granada, flowering in January and February, at which season the root is collected by the native Indians, and taken to the chief ports for exportation. The pieces are a few inches long and of the size of straws, much bent and sometimes branched, and in the genuine article always knotted on the surface by rings and depressions which have given it the designation of annulated. The central portion is ligneous, and possesses the virtue of the plant in a much less degree than the cortical covering of the root. The different colors of this portion, sometimes red, brown, or gray, have led to the mistake of referring the root to different varieties of the plant according to these colors. The alkaline principle, called *emetia*, has been separated in an impure state from the cortical part of the brown root in the proportion of 16 per cent., and from the red of 14 per cent. This principle, to which the emetic property of the plant is owing, is hardly to be obtained pure, but is probably a salt, the alkaloid uniting with many acids to form crystallizable salts. It appears as a white powder without odor, and of slightly bitter taste. Ipecacuanha was long ago used as an emetic by the natives of South America. It was introduced into medical practice in Europe by John Helvetius, grandfather of the celebrated author of that name, and with such success that a large sum of money and public honors were bestowed by Louis XIV. upon the physician for giving publicity to the remedy, which he had kept secret. It is administered in powder suspended in water in quantities varying according to the effect desired. In large doses it is an active and quick but mild emetic; in smaller, a diaphoretic and expectorant; and in still smaller, a stimulant to

the stomach. It is a valuable remedy in dysentery, and in whooping cough, asthma, and other diseases, it is advantageously used for exciting nausea. As an alterative it is employed in very small quantities frequently given.

IPHICRATES, an Athenian general who lived in the 1st half of the 4th century B. C. He first distinguished himself at the battle of Cnidus, where he captured one of the Spartan trierarchs. In 393 B. C., he commanded the Athenian auxiliaries at the battle of Lechæum, in which the allies were defeated by the Lacedæmonians under Praxitas. The guerilla system subsequently adopted by the belligerents in that war seems to have suggested to Iphicrates the formation of a body of light-armed foot soldiers called *peltastæ*, with whom he attacked a division of the Lacedæmonian army near Corinth, and almost destroyed it. He next recaptured Lidas, Crommyon, and Cenoë from the Spartans; but the Athenians, listening to Argive calumnies, deprived him of his command. In 389 he was reinvested with authority, and sent to the Hellespont to counteract the operations of the Lacedæmonian Anaxibius, whom he defeated in the following year. After the peace of Antalcidas, Iphicrates entered into alliance with Cotys, a Thracian prince, who gave him his daughter in marriage, and allowed him to found a city in his territory. In 377 he was sent with 20,000 Greek mercenaries to aid the Persian satrap Pharnabazus in reducing Egypt to obedience. This enterprise proved unsuccessful. The policy of Iphicrates was too daring for the wary barbarian. The commanders quarrelled, and the Greek, fearing for his safety, fled to Athens, where he was denounced by Pharnabazus for having caused the failure of the expedition. The Athenians, however, in the next year appointed him to the joint command of the armament which they sent against Corecra. This enterprise was successful; Corecra was brought over to the Athenian alliance, and the fleet which the Syracusan tyrant Dionysius had sent to the assistance of the Lacedæmonians was defeated. In the war which grew out of the seizure of Thebes by the Spartans, Iphicrates commanded the Athenian forces sent against the Thebans. He afterward commanded in Thrace, and in the social war, in conjunction with Timotheus, Menestheus, and Chares, the last named of whom sought to shield himself from the consequences of his ignorance by prosecuting his colleagues. Iphicrates was acquitted, and spent his latter days at Athens.

IPHIGENIA, a daughter of Agamemnon and Clytemnestra, and a favorite heroine with the poets and tragedians of Greece. Agamemnon, having once killed a stag in the grove of Diana, sought to appease the offended goddess by vowing that whatever, most beautiful, was born to him in that year should be sacrificed to her. His daughter Iphigenia chanced to be born within the period specified; but the king put off from time to time the performance of his vow until the Grecian armament was assembled on the port

of Aulis to sail against Troy. The winds proving unpropitious, Calchas the seer was consulted, and replied that the sacrifice of the daughter of Agamemnon was indispensable to propitiate the gods. But Agamemnon still resisted, and only yielded to the importunities of Menelaus. When Iphigenia was about to be immolated, Diana herself intervened to save her, and bore her in a cloud to Tauris, where Iphigenia became her priestess. Her brother Orestes came thither, in order to steal the image of Diana, which was believed to have fallen from heaven, and to transport it to Hellas. Iphigenia recognized him, and aided him in obtaining the desired image, with which they fled to Argos. Iphigenia afterward carried the image to Sparta, where she continued to act as priestess of Diana during the rest of her life.

IPSAMBUL. See ABOO SAMBOOL.

IPSWICH, one of the shire towns of Essex co., Mass., situated on both sides of Ipswich river, 4 m. from the sea, and 27 m. by the eastern railroad N. E. from Boston; pop. in 1855, 3,421. The river affords valuable water power, and in a bay of the same name at its mouth there is an excellent harbor. A number of fishing vessels are owned here, and the town is interested to some extent in the coasting trade, and has small ship yards. There is a stone bridge across the river, built in 1764. Ipswich contains an asylum for the insane, a well known female seminary, a free grammar school founded in 1650, and a public high school for both sexes. In 1858 it had 4 churches (3 Congregational and 1 Methodist). The principal industrial occupation is agriculture. The most important manufacturing establishments in 1855 were a cotton mill, with a capital of \$40,000, 5 manufactories of hosiery, 1 of soap and candles, and 1 tannery. About \$70,000 worth of boots and shoes were also made during the previous year. The town was settled in 1633. Its Indian name was Agawam ("fishing station").

IRAK-AJEMEE, a central province of Persia, comprising a portion of the great desert, and bounded N. by a range of mountains dividing it from the provinces of the Caspian, E. by Khorassan, S. and S. W. by Fars and Khuzistan, and W. and N. W. by Luristan, Ardelan, and Azerbaijan; area estimated at 73,000 sq. m.; pop. at 2,500,000. A large part of Persian Koordistan is included in this province. The surface consists chiefly of a high table-land traversed by several mountain ridges and fertile valleys. The Kizil Oozen and Kerah are the principal rivers. The country is almost destitute of trees, and a considerable portion of arable land is uncultivated, but there are excellent pasture lands. Ispahan, Teheran, Hamadan, Casveen, Senna, Kermanshah, and Koom are the principal towns.

IRAN. See PERSIA.

IREDELL, a W. co. of N. C., partly bounded on the E. by Catawba river, and drained by branches of the Yadkin; area, 695 sq. m.; pop. in 1850, 14,719, of whom 4,142 were slaves. It

has an uneven surface and a good soil. The productions in 1850 were 53,111 bushels of wheat, 506,491 of Indian corn, 134,648 of oats, 46,797 of potatoes, 34,875 lbs. of tobacco, and 4,933 tons of hay. There were 9 grist mills, 7 tanneries, 38 churches, and 2,399 pupils attending public schools. Capital, Statesville.

IREDELL, JAMES, an American jurist of Irish ancestry, born in Lewes, co. of Sussex, England, Oct. 5, 1751, died in Edenton, N. C., Oct. 20, 1799. His father was a merchant in Bristol, and his failure there made it necessary that the son, while very young, should seek the means of an independent livelihood. He was appointed comptroller of the customs at Port Roanoke, now Edenton, where he arrived in 1768. He retained this office several years, and in the meanwhile studied law in the office of Samuel Johnston, afterward governor, whose sister became his wife. His first law license was granted by Gov. Tryon, Dec. 14, 1770. He was appointed by the attorney-general his deputy in 1774, and in 1777 was placed by the legislature on the bench of the supreme court, then just organized under the state constitution. Having resigned this office, he was appointed by Gov. Caswell, in 1779, attorney-general of the state. This post he resigned in 1782. In 1787 he was designated by the general assembly sole commissioner to collect and revise the acts of previous assemblies, which were to be considered in force in North Carolina. This collection of the laws, now referred to as "Iredell's Revision," was published in 1791. In Feb. 1790, he was nominated by President Washington to be one of the justices of the supreme court of the United States, and held that office till his death. At the beginning of the controversy which resulted in the revolution, Mr. Iredell's youth and his service under the crown kept him from taking a prominent part; but at a somewhat later period there were few men in North Carolina who exerted a stronger influence on the public movements of that day. In the convention which met at Hillsborough in 1788, and which rejected the federal constitution, he was (perhaps after Gen. Davie) the leading spirit. While at the bar in North Carolina, he aided very much in giving tone and order to the judicial system of the state. "The celebrated court law," so called, organizing the judiciary, and the one which gave the courts their equity jurisdiction, are supposed to be due to him. His judicial opinion in the case of *Chisholm vs. Georgia* contains the germs of all the later doctrines of state rights. The "Life and Correspondence" of Judge Iredell has been published by Griffith J. McRee (2 vols. 8vo., New York, 1857).—JAMES, son of the preceding, born in Edenton, Nov. 2, 1788, died in Raleigh in 1853. He was graduated at Princeton in 1806, and was bred to the bar. He served for 10 years in the house of commons of his native state, and twice as speaker in a house of which the majority were politically opposed to him. In the war of 1812 he commanded a company of volunteers, and was stationed at

Norfolk, Va. In 1819 he occupied, during one circuit, a seat on the bench of the superior court, declining a further appointment. In 1827 he was governor of North Carolina, and from 1828 to 1831 a member of the senate of the United States. He afterward resumed the practice of his profession at Raleigh, where he was also for many years the reporter of the decisions of the supreme court of North Carolina. He published 13 volumes of law and 8 of equity reports. In 1833 he was appointed by Gov. Swain one of three commissioners to collect and revise all the statutes in force in North Carolina. The result was the work known as the "Revised Statutes." He afterward published a "Treatise on the Law of Executors and Administrators."

IRELAND, a European island, forming part of the United Kingdom of Great Britain and Ireland, situated between lat. 51° 26' and 55° 21' N. and long. 5° 20' and 10° 26' W.; bounded N., S., and W. by the Atlantic ocean, and E. by St. George's channel, the Irish sea, and the Northern channel, which separate it from England and Scotland. In shape it is a rhomboid, the greatest diagonal of which is 300 m. and the smallest 210 across; greatest meridional length 230 m., greatest and smallest breadth 180 and 110 m.; area, 32,508 sq. m. It is divided into 4 provinces, Leinster, Munster, Ulster, and Connaught, and 32 counties, which, with their area, population, and chief towns, are given in the following table:

Provinces and counties.	Area, sq. m.	Pop. in 1841.	Pop. in 1851.	Chief towns.
LEINSTER:				
Carlow	346	86,228	68,075	Carlow.
Dublin	354	872,773	404,992	Dublin.
Kildare	654	114,458	95,724	Naas.
Kilkenny	796	202,420	158,746	Kilkenny.
King's	772	146,557	112,050	Birr.
Longford	421	115,491	82,350	Longford.
Louth	815	128,240	107,657	Drogheda.
Meath	906	183,828	140,750	Navan.
Queen's	664	153,930	111,623	Maryborough.
Westmeath	709	141,300	111,402	Mullingar.
Wexford	901	202,033	179,790	Wexford.
Wicklow	751	126,143	98,975	Wicklow.
MUNSTER:				
Clare	1,294	286,394	212,425	Ennis.
Cork	2,835	854,118	648,902	Cork.
Kerry	1,553	293,850	238,239	Tralace.
Limerick	1,064	330,029	262,136	Limerick.
Tipperary	1,659	435,553	331,457	Tipperary.
Waterford	721	196,187	164,051	Waterford.
ULSTER:				
Antrim	1,164	360,875	352,264	Belfast.
Armagh	512	232,389	198,055	Armagh.
Cavan	746	243,158	174,071	Cavan.
Donegal	1,865	296,448	255,160	Donegal.
Down	956	361,446	328,883	Downpatrick.
Fermanagh	714	156,451	116,007	Enniskillen.
Londonderry	810	222,174	191,868	Londonderry.
Monaghan	500	200,442	141,758	Monaghan.
Tyrone	1,260	312,956	255,519	Dungannon.
CONNAUGHT:				
Galway	2,447	440,198	322,212	Galway.
Leitrim	618	155,297	111,915	Carriek-on-Shannon.
Mayo	2,131	388,887	274,890	Castlebar.
Roscommon	950	233,591	174,492	Roscommon.
Sligo	722	180,886	128,510	Sligo.
Total	32,512	8,175,124	6,553,291	

Between 1841 and 1851, as will be seen, there was a decrease of over 1,600,000, due to the intervening famine and increasing emigration. In 1853

the population was estimated at 6,013,103.—The indentations of the coast by harbors, arms of the sea, and mouths of rivers, are numerous, and the sea or means of navigation can be reached from almost any part of the country within a distance of 50 m. The total number of harbors is about 90, viz.: 14 which can receive the largest men-of-war, 14 large enough for frigates, about 37 for coasting vessels, and 25 for good summer roadsteads, beside many inlets which admit fishing craft. The principal harbors are Cork, Waterford, Youghal and Kinsale, Bantry bay, and Valentia harbor, one of the finest in the world, Galway bay, Donegal bay, and the beautiful bay of Dublin, with Kingston harbor. The number of lighthouses is 62, and of floating lights 3. Nearly 200 islands are scattered chiefly along the W. coast. Few countries are so well supplied with rivers and lakes. The Shannon is the largest river in the United Kingdom. Among the other rivers are the Bandon, Lee, Blackwater, Suir, Barrow, Slaney, Bann, Foyle, the Boyne, celebrated by its historical associations, the Liffey, and many others. Among the lakes, Lough Neagh is the largest of the United Kingdom, and one of the largest in Europe. The other considerable lakes are Lough Erne, Lough Corrib, Lough Mask, and Lough Derg. The latter, an enlargement of the course of the Shannon, must not be confounded with a small lake of the same name in the S. of Donegal, known by its islet St. Patrick's Purgatory, an ancient and popular resort as a place of penance for Roman Catholic pilgrims. Many of the smaller lakes are renowned for their beautiful and picturesque scenery, especially the lakes of Killarney in Kerry. The country is interspersed with low hills, forming toward the sea mountain ranges consisting chiefly of the primitive rocks, while the central plain consists of calcareous strata. The carboniferous limestone prevails most extensively. Next to it the principal rocks are granite, quartz, mica slate, old red sandstone, clay slate, and yellow sandstone. Many varieties of unstratified igneous rocks are found. Trap rocks abound in various parts of Ireland, and particularly in Antrim, where they often rest on indurated chalk. The principal development of quartz is in Mayo and Donegal. The only instances of tertiary formation hitherto discovered are the clays which contain lignite on the S. shore of Lough Neagh. Several coal fields exist, resting on a limestone basis, the principal district being that of Leinster. The coal of this and of the Munster district is anthracite, and that of Connaught bituminous. One of the best kinds of coals is found in the district of Coal Island, county of Tyrone, Ulster. The quantities produced, however, are comparatively insignificant, and the consumers depend on the importation of English coal. The country is supposed to contain much lead, copper, and iron, but as yet few mines have been found very productive. The more considerable copper mines are in the county of Wicklow, in the Waterford district, and in the S. W. and W. district. Lead

is more widely diffused than copper; the principal veins are in the granitic district of Wicklow. At the end of the 18th century gold was discovered in the streams flowing on the confines of Wicklow and Wexford, but all attempts to derive advantage from the discovery proved useless. Silver was also found in a bed of iron ochre in Cronebane, but the deposit has been long since exhausted. Other minerals of Ireland are manganese, antimony, zinc, nickel, iron pyrites, alum, clay, building stone, marble, flags, and roofing slates. There are mineral springs, mostly chalybeate, in different parts of the country. The central part of Ireland contains over 1,500,000 acres of flat bog, the greater portion of which lies W. of the Shannon in the counties of Galway, Roscommon, and Mayo; the rest extends in various tracts through King's county, Longford, Westmeath, and Kildare, and is collectively called the bog of Allen. The total area of turf bog, from which the chief supply of fuel is obtained, comprises nearly 3,000,000 acres.—The climate of Ireland is characterized by mildness and humidity. The verdure of the pastures is peculiarly rich, and the soil is remarkable for its fertility and appropriateness for almost all kinds of agricultural uses. The arable surface is covered with deep friable loam of great richness, and the soils consist of vegetable mould, of decomposed trap, and of calcareous matters derived from the generally prevailing limestones. The country is very deficient in wood, although it is said to have been formerly covered with forests. The timber found in the bogs consists of oak, fir, yew, holly, and birch. The progress of agricultural improvement, and the timber act, which secures to the tenant at the expiration of his lease a pecuniary interest in the trees he has planted, promises a large supply of wood in future. Ireland produces all sorts of grain, potatoes, flax, and hemp. It is rich in cattle, horses, especially hunters, and sheep (with less wool than the English). There are many rabbits, but little game excepting deer, of which there were 17,175 in 1851. Fish abound, especially the salmon, pike, eel, and trout. The sun fish frequents the western coast, which is occasionally visited also by whales. Seals are met with about the exposed headlands. There are also oysters and frogs, but no toads or serpents. Bones of the elk or moose deer have been found in several places in Ireland. Wolves were once numerous, and the Irish wolf dog was kept for hunting them. Of poultry the product is extensive. The flora of Ireland includes the *arbutus unedo* along the lakes of Killarney; new species of saxifrage and ferns have been discovered on the Kerry mountains; rare alpine plants are met with in Connemara, Benbulbin mountain (Sligo), and in the county of Antrim, and peculiar kinds of algæ on various parts of the coast.—The bulk of the inhabitants have a stronger resemblance to the races of southern than of northern Europe. This is most apparent in those parts of Ireland where English and Scotch

settlers do not preponderate. They are more impulsive and warm-hearted and less controlled by calculation than the people of England and Scotland. As settlers in other parts of the world, especially in the United States, the Irish have proved very useful and industrious in various kinds of manual occupation, but at home they are principally devoted to the tillage of the soil. A marked improvement in the condition of the country has taken place within the last 20 years. The work of bringing waste lands into cultivation reduced the uncultivated land from 6,295,735 acres in 1841 to 5,023,984 in 1851. The improved condition is best ascertained by reference to the class of dwellings occupied in the respective periods. These are divided into 4 classes. The 4th or lowest class comprises mud cabins of one room; the 3d, mud cottages of more than one room; the 2d, farm houses, or in towns those having from 5 to 9 rooms and windows; and the 1st or highest class are houses of a superior description. The houses of the 1st class had increased from 40,089 in 1841 to 50,164 in 1851; of the 2d, from 264,184 to 318,758; of the 3d, from 533,297 to 541,712; and those of the 4th class had decreased from 491,278 to 185,589, showing that between 1841 and 1851 over 350,000 of these wretched mud cabins had disappeared from Ireland. Emigration, which had been powerfully stimulated by the potato disease of 1846-7, shows a steady decrease since 1852, as follows: 1852, 190,322; 1853, 173,148; 1854, 140,555; 1855, 91,914; 1856, 71,724; 1858, 64,337. Pauperism shows also a steady decline. The total number of paupers relieved was, in 1848, 2,043,505; 1849, 2,142,766; 1850, 1,174,267; 1851, 755,347; 1852, 519,775; 1853, 409,668; 1854, 319,616; 1855, 305,226; 1857, 190,851; 1858, 183,056. The following statement shows the progress of the agricultural wealth of the country: land under cultivation in 1854, 5,570,610 acres; 1855, 5,682,992; 1856, 5,753,681; 1857, 5,559,646; 1858, 5,892,052. Of the last number, 2,748,380 were under cereal crops, 1,159,707 under potatoes, and 1,973,965 under other crops, including meadow and clover. The produce in 1858 was: wheat, 1,746,464 quarters; oats, 8,953,541; barley, 802,028; bere, 24,866; rye, 38,858; beans, 44,852; peas, 4,877; potatoes, 4,892,225 tons; turnips, 4,364,788; mangel-wurzel, 404,423; carrots, 381,484; hay, 2,701,006; flax, 2,813,283 stones. The stock in the same year consisted of 610,717 horses, 640,201 cattle, 3,487,785 sheep, and 1,402,812 pigs, showing an increase in value over 1855 estimated at about £100,000.—In manufactures there is also greater activity. The linen manufacture is the most important branch of Irish industry. The spinning wheel of the Ulster cottier gave place to the spindle in the early part of this century, when the first flax-spinning machinery was erected. The number of flax factories has increased from about 70 in 1849 to 110 in 1856, with 567,980 spindles and 1,691 power looms, and employing 28,753

persons. One of the chief seats of this manufacture is Belfast. The export of linen to Great Britain and foreign countries is valued at about £4,500,000. Of cotton factories there were 12 in 1856, woollen factories 27, and worsted factories 6. The silk manufacture, which was introduced into Dublin by French emigrants at the end of the 17th century, proved unprofitable; almost the only branch now flourishing is a fabric of mixed worsted and silk, known as Irish poplin or tabinet. Lace is manufactured to some extent in Limerick. A great progress has been made within the last few years in the manufacture of embroidered muslin. The chief seat of this industry is in Glasgow; but while the initiatory and concluding manipulations connected with it are almost wholly performed in that city and its neighborhood, the needlework, although partly wrought in Scotland, is chiefly executed by the peasantry of Ireland. A large number of females are employed in this work, and the amount of wages paid for it in Ireland is estimated at about £400,000 annually. Spirit distilleries were established in Ireland at an early period. The amount of spirits distilled in 1857 was 10,073,860 galls., and in 1858, 8,325,367 galls. The duty, which was formerly 6s. 2d., has since been equalized at 8s. per gallon. The local consumption in 1857 was 6,920,046, and in 1858, 6,402,142 gallons. In 1857 there were 105 breweries in Ireland, using 2,983,934 bushels of malt. The number of licensed victuallers was 16,827.—Among the fisheries of Ireland, those of salmon and herring are flourishing. The whole number of vessels and boats employed in fisheries is about 13,000, and the number of persons 60,000. In the coasting trade of Ireland, the entrances in 1858 were 17,024 sailing vessels, all British but 5, tonnage 1,266,466, and 6,564 steam vessels, tonnage 1,781,970; the clearances were, 6,615 steam vessels, tonnage 1,826,937, 7,458 British sailing vessels, tonnage 439,599, and 74 foreign sailing vessels, tonnage 12,261. The registered shipping in 1858 numbered 1,005 vessels under 50 tons, tonnage 29,287; 1,087 over 50 tons, tonnage 197,124; 30 steam vessels under 50 tons, tonnage 869, and 125 above 50 tons, tonnage 34,757. The commerce of Ireland consists of the provision trade and of the trade in the produce of the country with Great Britain, and that with foreign nations. The exports are mainly sent to Liverpool, Bristol, and Glasgow, from Belfast, Dundalk, Drogheda, Newry, Waterford, and Limerick, and particularly from Cork and Dublin. The entrances of vessels engaged in the foreign trade in 1856 comprised 1,040 British, tonnage 246,679, and 537 foreign, tonnage 123,259; total, 1,577 vessels, tonnage 369,938. Of these, 407 were from British colonies. The principal ports of entry were Cork, Dublin, Belfast, Waterford, Limerick, Londonderry, and Newry. The importation of grain into Ireland in 1857 comprised 492,428 quarters of wheat, 104,632 of barley, 3,583 of oats, 9,202

of rye, 572,893 of Indian corn, 61,747 cwt. of wheat meal, and 4,266 of rye meal. The exports of grain in 1855 were 1,980,397 quarters of oats and oatmeal, and 170,000 of wheat, almost all to Great Britain. The exports of animals to Great Britain were 214,636 oxen and bulls, 8,162 calves, 489,494 sheep, and 254,054 swine. The exports to foreign countries consisted of 14 horses, 292 cwt. of bacon and ham, 7,943 barrels of beef and pork, 17,475 cwt. of butter, 66,053 yards of linen manufactures, and 360,780 yards of cotton manufactures. The extensive commercial intercourse between Ireland and the United States has since 1858 derived an additional importance from the steamship communication between Galway and New York. Marble, porter, ale, whiskey, and manufactured goods from Dublin, Belfast, and Manchester have already been shipped by the steamers; and tobacco, wheat, and corn are received in return from New York. Among the foreign vessels touching at Cork, mostly for orders, there were 114 under the American flag from Jan. 1 to Oct. 1, 1858, with cargoes valued at \$12,000,000. The total number of American and foreign vessels which cleared from the United States for Ireland during the year ending June 30, 1858, was 83, tonnage 37,023. The value of American products and manufactures exported in the same year was nearly \$1,500,000, and of foreign goods about \$300,000.—The following railways were open in Ireland in the early part of 1860: Bagenalstown and Wexford; Ballymena, Ballymoney, Coleraine, and Portrush junction; Belfast and Ballymena; Belfast and County Down; Cork and Bandon; Cork, Blackrock, and Passage; Dublin and Belfast junction; Dublin and Drogheda; Dublin and Kingston; Dublin and Wicklow; Dundalk and Enniskillen; great southern and western; Limerick and Castle Connell; Londonderry and Coleraine; Londonderry and Enniskillen; midland great western; Newry and Armagh; Newry, Warrenpoint, and Rostrevor; Portadown, Dungannon, and Omagh junction; Ulster; Waterford and Kilkenny; Waterford and Limerick; Waterford and Tramore. The amount authorized to be raised on them is £21,793,624, and the capital actually raised up to Jan. 1, 1859, was £17,161,451. The number of miles open is 1,188, and of passengers carried about 10,000,000 annually. The total receipts are estimated at £1,300,000, of which £400,000 is for freight and the rest for passengers. The extent of the various lines of inland navigation is as follows: Grand canal with its branches, 164 m.; royal canal with its branches, 99; lower Shannon navigation, 44; Limerick navigation, river and canal, 15; middle Shannon navigation, 39; upper Shannon navigation, 59; Lagan navigation, river and canal, 28½; Newry navigation, do., 16½; Tyrone navigation, do., 11½; lower Boyne navigation, do., 19; Slaney navigation, do., 16; Barrow navigation, do., 78; Ulster canal, 24; total, 613½ m. The total amount of the share capital of all the canal companies in Ireland

in 1857 was nearly £700,000. The means of communication in Ireland has been further stimulated by a system of conveyance organized by Mr. Bianconi.—Vast amounts have been advanced by the government (according to statistics of 1857, nearly £10,000,000) for the improvement of land by means of arterial and thorough drainage, post roads, farm buildings, &c. The sums granted by government for public buildings in Ireland was £77,557 in 1857, and £60,651 in 1858. The encumbered estates court, established in 1849, has brought into market smaller holdings and estates overburdened by debt, and has proved of the greatest advantage to the prosperity of the country. The total amount expended in the purchase of property under control of the court from 1849 to 1858, when it was replaced by the landed estates court, was £22,000,000, of which £3,000,000 was invested by English and Scotch purchasers. The number of estates sold was 2,380, divided into more than 11,000 lots, and 8,235 conveyances have been executed by the commissioners. The total number of letters delivered in Ireland in 1858 was 44,000,000, giving an average of 7 letters for each person; the average in England having been 22, and in Scotland 16. The number of money orders issued through the post office in 1858 was about 500,000, to the amount of nearly £900,000. In England 5,700,000 orders were issued to the amount of about £11,000,000, and in Scotland 500,000, representing a value of £1,000,000. The number of secular and religious journals and magazines published in Ireland is about 150. Savings banks were introduced in 1810; in 1845 the amount deposited reached nearly £3,000,000, but owing to the famine they fell below £1,500,000 in 1849; a gradual increase has since taken place, bringing the deposits up again to about £2,000,000. Of loan societies there were 111 in 1857, which advanced 204,394 loans, the amount circulated during the year being over £900,000. The bank note circulation in Ireland in 1858 and 1859 was between £6,000,000 and £7,000,000. There are 10 banks in Ireland, all issuing their own notes excepting the Hibernian joint stock company and the royal bank of Dublin. The most important is the bank of Ireland, which acts as banker to the government, and which is bound to make weekly returns similar to those of the bank of England. It has 23 branches; its capital is £3,000,000, its reserve fund about £1,000,000, and at the end of 1857 it circulated notes to the amount of about £3,000,000. The next most important establishment is the provincial bank of Ireland, with a capital of £2,000,000 and 38 branches.—The public institutions in Ireland for religious, benevolent, and educational purposes are numerous. The established church of Ireland is the Episcopal or Anglican, divided into two ecclesiastical provinces. The archbishop of Armagh and Clogher presides over the N. province, and is the primate and metropolitan of all Ireland. At the head of the other

province is the archbishop of Dublin and Kildare, primate of Ireland. They are assisted by 10 bishops. The bishop of Meath takes precedence of all the other bishops. The representative prelates for 1860 are the archbishop of Armagh, and the bishops of Cashel, Derry, and Limerick. The number of clergy is about 2,000. The number of bishoprics was formerly much larger. The revenues of the suppressed sees, together with those of suspended dignities and benefices, are vested in a board of commissioners, to be applied by them to the erection and repair of churches and other ecclesiastical purposes. The total receipts of the commissioners for the year ending Aug. 1, 1857, were about £140,000. The revenues of the church amount to about £600,000, derived principally from tithe commutations, glebe lands, &c., including the revenues of the sees of archbishops and bishops, which amount to nearly £70,000. The dignitaries of the Roman Catholic church are the 4 archbishops of Armagh, Dublin, Cashel, and Tuam, and 24 bishops. The number of priests is upward of 2,000, nominated by the bishops, and supported altogether by voluntary contributions. Of Presbyterian, Methodist, Baptist, Unitarian, and Independent churches and ministers there are upward of 800. The majority of the population, however, are Roman Catholic, and hardly $\frac{1}{3}$ are members of the established church and of other Protestant denominations. Of Jews there are but few in Ireland.—The chief educational institution is the university of Trinity college, Dublin, with an average attendance of nearly 2,000 students. Among the other principal seats of learning are the queen's colleges of Belfast (219 students in 1858-'9), Cork (114 students), and Galway (113 students), established by acts passed in 1845 and 1850. The amount of grants to the university and the 3 colleges in the year ending March 11, 1859, was £26,930. Maynooth college is the chief institution for the education of Roman Catholics for the priesthood; the number of students varies from 400 to 500. The establishment of a Roman Catholic university was agreed upon by a synodical meeting in 1854. There are 7 royal endowed schools, and 7 endowed by private means. The church education society has nearly 2,000 schools with about 100,000 pupils, $\frac{1}{4}$ of whom are Roman Catholics and the rest Protestants, chiefly of the established church. The grants of public money for the education of the poor, which amounted to £250,000 in 1859, have been placed since 1837 under the superintendence of commissioners, who were incorporated in 1845 under the name of the commissioners of national education in Ireland. In 1859 there were 5,335 schools in operation, including 3,683 Roman Catholic, 597 of the established church, 688 Presbyterian, and 26 of other Protestant denominations. Half the Protestant schools are under clerical and half under lay management. Those of the Roman Catholics are all under clerical control, except 298, which are lay. The schools are attended by over 500,000 boys and

girls, the proportion of the former being rather larger, $\frac{3}{4}$ Roman Catholics and the rest Protestants. In 1841 there were only 61 out of every 1,000 children attending school; in 1851, 76 in every 1,000; and the proportion has since been steadily increasing. The total number of teachers is about 9,000 (including over 500 females), at an annual expense of £150,000. The national schools include 20 devoted to agriculture. Beside these, and beside the famous Albert model agricultural school at Glasnevin, near Dublin, in 1857 there were 18 model agricultural schools under local management, 50 ordinary, and 70 workhouse agricultural schools. The value of stock, crops, implements, and buildings in the model schools alone in 1857 was over £80,000. The total number of pupils in all the agricultural schools is over 5,000. The principal establishments for the promotion of literature, science, and art are situated in Dublin, but literary and mechanics' societies are scattered all over the country. The great industrial exhibition of 1853, called into existence by the exertions of William Dargan, produced increased interest in institutions calculated to diffuse a knowledge of useful sciences among the people. The foundation for a national gallery of art was laid in Dublin in 1859, and the museum of Irish industry, with a school of science applied to mining and arts, established within the last few years, is attended by over 6,000 students and visited annually by 30,000 persons. Medicine, the various branches of natural history, archæology, and other departments of science as well as of the fine arts, are represented by numerous societies in Dublin, Belfast, and other towns.—Charitable institutions abound in Ireland. Infirmaries for counties and cities supported by assessment and governed by corporations afford annual relief to about 60,000 sufferers. Public hospitals for counties, districts, and poor law unions are distributed over the country, beside various private establishments. According to the census taken March 30, 1851, there were 104,495, or $\frac{1}{8}$ of the population, sick or infirm. Of these 5,180 were deaf and dumb, 7,587 blind, 4,375 lame and decrepit, and 5,046 lunatic. There are houses for the relief of the poor in 163 unions of Ireland. The poor law system is conducted with a view of assisting those who cannot support themselves by their personal labor, but at the same time of discountenancing in able-bodied persons all dependence on eleemosynary relief. The poor rate is levied under the assessment of poundage rate on the net annual value of various kinds of ratable property. In 1857-'8 the valuation of the assessable property was £12,000,000, and the average poundage 9d., the lowest amount being 5½d., the highest 1s. 7d. The total amount expended on the relief of the indigent in that year was £457,367, chiefly for in maintenance—out-door relief, which was afforded so extensively during and for some time after the famine, having since been very little required. Out of 183,056 persons assisted during the year, only 5,851 received out-door re-

lief. Over 4,000 orphan girls from the work-houses were sent to Australia from 1848 to 1851, the government granting a free passage; and the number of emigrants sent out or assisted by boards of guardians in 1853 amounted to 3,825, consisting of 2,218 females, 1,115 children, and the rest males. The number of offenders tried at assizes and quarter sessions has materially decreased since 1849; the number convicted in that year having been 21,202 (including 10,649 females), and in 1854 only 7,051 (3,851 females). In 1846, 23,282 persons were committed for drunkenness; in 1854, 12,215; and in 1857, only 9,557, the exertions of Father Mathew having given a great impulse to the cause of temperance. The total number of persons committed or held to bail in 1857 was 7,210 (including 1,752 females), of whom 3,285 were acquitted. Of the convictions, 1,036 were for offences against the person, 1,955 against property (1,641 without and the rest with violence), 57 for forgery and offences against the currency, and the rest for miscellaneous offences. Only 8 were sentenced to death, and none were executed; 40 were sentenced to transportation, 396 to penal servitude, 2,674 to imprisonment, and the rest whipped, fined, discharged on sureties, or pardoned. There are held in Ireland nearly 600 petty session courts. The number of county prisons is 34 (27 with treadmills), of city or town prisons 10, and of bridewells 114. A law for the promotion and regulation of reformatory schools for juvenile offenders was passed in 1858. The decrease of crime, drunkenness, and pauperism in Ireland is among the most cheering evidences of the increased prosperity of the country.—The government is administered by a viceroy or lord lieutenant (in 1860, the earl of Carlisle), who is assisted by a privy council appointed by the crown, and by a chief secretary for Ireland, a cabinet minister (in 1860, the Rt. Hon. E. Cardwell). In the absence of the lord lieutenant, he is replaced by lords justices, usually the primate or archbishop of Dublin, the lord chancellor, and the commander of the forces. Each county is in charge of a lieutenant, generally a peer of the realm, assisted by deputy lieutenants and magistrates who officiate gratuitously, and one or more resident paid magistrates, all appointed by the crown during pleasure. The cities and towns and the boroughs are governed by local magistrates. Justice is administered by the lord chancellor, the master of the rolls, 4 judges in each of the courts of the queen's bench, common pleas, and exchequer, an assistant barrister for each county, a bankrupt court with two judges, and the judges of the prerogative court and of the admiralty. Assizes for criminal and civil pleas are held by two of the judges in each county in spring and summer of every year. The execution of the laws is intrusted to the constabulary in the counties and the police in Dublin. The total of the constabulary amounted, Jan. 1, 1859, to 12,003 men with 346 horses, and a reserve of 181 men; but there were at that time about

500 vacancies in the force. The total expense of the constabulary was £653,256, and that of the Dublin police (including the expense of 72 stipendiary magistrates), which numbers nearly 1,100 men, £75,000. The revenue police, organized for the suppression of illicit distillation, comprises about 1,200 officers and men. The Irish militia is composed of 12 regiments of artillery and 35 of infantry, numbering when embodied 31,000 men.—Ireland is represented in the British parliament by 4 spiritual peers in rotation, 28 temporal peers elected for life, and 105 commoners. Of the latter, 64 represent the counties, 2 the university, 12 the cities and towns of Dublin, Cork, Limerick, Waterford, Belfast, and Galway, and 27 the boroughs. In the counties there are now (according to a general estimate in round numbers) one elector for each 37 persons and one member for each 86,000; and in the towns, one elector for each 28 persons and one member for each 9,000 of the population. The net produce of the revenue in Ireland in 1857 was: from customs, £2,098,353; the excise, £2,934,000; property and income tax, £1,076,996; stamps, £453,223; sundries, £333,275; total, £6,895,847. The expenditure was £7,852,693, but this amount includes only the payments made from the Irish exchequer, while another amount of expenditure on account of Ireland is included in the budget of the United Kingdom. The Irish permanent debt (forming part of the public debt of the United Kingdom), on March 31, 1857, was £43,692,145; the terminable debt, £587,200; and the total amount of interest payable, £1,526,793.—The antiquities of Ireland are of various kinds: cromlechs, cairns (either simple mounds or to mark burial places), pillar stones, barrows, duns or defences of stone, lis or fortifications of earth, raths or villages, ancient stone-roofed buildings, round towers (of which there are 118, in height from 35 to 120 feet, with an internal diameter of 10 to 16 feet), ecclesiastical architecture of all ages, with a vast number of castles and fortalices. Ancient weapons of bronze and ornaments of gold are frequently found in turning up the soil, the jewelry especially showing a high degree of artistic skill in the people by whom they were made. The characteristics of the mediæval architecture of Ireland have been more fully disclosed by the recent labors of Dr. Petrie and by the school which he has founded. The round or oval structures of rough stone and earth, popularly called beehive houses, which are still found in great numbers on the islands off the coast of Connemara, county of Galway, are probably of the 6th or 7th century. One of the most remarkable of these structures is on the great isle of Arran. Several ancient oratories built of uncemented stones, admirably fitted to each other, and their side walls, and to some extent also the end walls, converging from the base to the summit in curved lines, exist in the barony of Corkaguiny, county Kerry, and particularly in the vicinity of Smerwick harbor. The most beautifully constructed and

best preserved of these ancient relics is the oratory of Gallerus. One of the most noted buildings of the so called Cyclopean masonry is the chapel or house known as St. Kevin's kitchen, probably from the resemblance of the round tower on the W. gable to a kitchen chimney. A building perfectly unique in Ireland is Cormack's chapel, on the rock of Cashel, constructed in the 12th century, covered with ornaments of the richest Norman character, of the period and probably the work of Norman or English masons and sculptors. The church or chapel of St. Doulough's, near Dublin, dating from the 14th century, presents a singular combination of church, house, and castle all in one, and all comprised in the space of 40 feet long by 16 wide. Many parts of Ireland abound with ruins, especially of old manor houses, built in the form of towers for defence, and hence called castles, or the Irish towers. They are of all periods from the 12th to the 16th century. Beside these there are numerous real fortified castles, some of which furnish admirable specimens of the military architecture of the middle ages. Many smaller castles combining the military and domestic character are provided with keeps and exterior walls, after the fashion of the baronial castles of Britain. Conspicuous among these is Bullock castle, at Dalkey, near Dublin, which protected the port of Dalkey, where the commerce of Dublin was carried on for centuries. Among the principal tower houses are Loughmore castle, county Tipperary, Athenry castle, Galway, Blarney castle, near Cork, Augnamure castle, county Galway, on the borders of Connamara, and many others. Many buildings of the Elizabethan period exist in Galway; the finest among them are the Lynch castle and Castle Banks. Few countries offer so fine a field for the archaeologist.—According to the map of Ptolemy, the central portion of Ireland was inhabited in his day by the Scoti; the north by the Robogdii; the east by the Damii, Voluntii, Eblani, Cancii, Menapii, and Coriundi; the south by the Brigantes, Vodii, and Ibernii; the west by the Luceni, Velaborii, Cangani, Auterii, Magnatæ, and Havdinii. Strabo names the island *Ιερπη* (Ierne); Cæsar, Tacitus, and Pliny call it *Hibernia*; Mela and others, *Javerna*. The native name is *Ir*, *Eri*, and *Erin*. The name of *Ogygia* has also been applied to it. A very remote antiquity is claimed and supported with much display of erudition by Irish writers. During the reign of Ollav Fola, about 900 B. C., a species of parliament was organized, by a triennial assemblage at Teamor or Tara, of the chiefs, priests, and bards, who digested the laws into a record called the psalter of Tara. Kimbath, who reigned about 460 B. C., followed in the footsteps of Ollav Fola, by attending to the civil interests of his kingdom. Three reigns afterward arose Hugony the Great, who married a daughter of the king of Gaul, obliged the Picts to pay tribute, conquered the Western isles, and divided Ireland into 25 administrative provinces, and placed at the head

of each one of his 25 sons. Crimthan, a subsequent king, took to wife the daughter of a Pictish chieftain, and joined the Picts in their forays against the Romans. Tacitus mentions that, about this time, an Irish prince who had been exiled from his country solicited Agricola to invade Ireland, assuring him that a single legion would be sufficient to conquer it; but there is no trace or record of Roman occupation. Of Crimthan's successors it will suffice to mention Feredach, surnamed the Just; Tuathal, who erected temples for the sacred fire of the druids; Conn Keadcahagh, or Conn of the hundred battles, who was forced to give up half the kingdom to Mogha Nuod, king of Munster, their respective shares being partitioned by a wall and ditch from Dublin to Galway, the country north being Leagh Guin, or Conn's share, and south Leagh Mogha, or Mogha's share—names yet remembered. In the reign of Conn's grandson, Cormac, flourished the military brotherhood of the Fiana Erion, commanded, according to Irish legend, by Fein McCool or Fingal. This warrior band, which possessed the rude elements of chivalry, was cut to pieces at the battle of Gabra, in Meath, in the succeeding reign, as related in the poems of Ossian. Nial of the nine hostages fought in Scotland, England, and France, and was killed by an arrow on the banks of the Loire. His successor Dahy was killed by lightning, also in France. He was the last pagan king of Ireland, and his reign closes the more doubtful portion of Irish history. At this period the inhabitants were Scoti, who appear to have been to a great extent the successors of another people of superior civilization whose monuments exhibit a close affinity with the Belgæ of southern Britain. A people called Cruithne, identified with the Picts, remained separate from the Scoti till after the conversion to Christianity. From the 3d to the end of the 10th century, the whole island took the name of Scotia, a term not then applied to the country now called Scotland. In the reign of Logary, or Laera II., Dahy's successor, Pope Celestine sent the monk Palladius to convert the natives, but he met with little encouragement. St. Patrick, a native of Scotland, who, having been taken prisoner in his youth by Nial of the nine hostages, was kept for 7 years herding swine, and acquired the Irish language, was more successful. Patrick, having first studied under his uncle, the bishop of Tours, went to Rome, whence he was despatched, A. D. 488, with 34 assistants. After various discouragements he converted the king (498), and passed the rest of a life protracted to 120 years in travelling through Ireland, gaining converts, and founding churches and monasteries. A considerable advance in civilization followed the introduction of Christianity. Learning obtained some footing among the clergy, and a school founded at Armagh became famous throughout Europe. For a time the island was so noted for its learned ecclesiastics that it was spoken of as *insula sanctorum* (isle of saints). According to Bede, in the year

646 many Anglo-Saxons settled in Ireland. In 684 it was invaded by Egfred, king of Northumberland, who ravaged many churches and monasteries. A more serious invasion of the Norwegians and Danes, known by the name of Estlanders, took place in the end of the 8th century. They erected solid buildings in the country (the dwellings of the natives having been hitherto huts of earth), and oppressed the people with great severity for 2 centuries, the greater part of the country being in their hands. In 1002 Brian Boru, or Boroinhe, king of Munster, expelled the Danes from his own kingdom, and was crowned at Tara as king of Ireland. Ere long he expelled the Danes from the country. Having accomplished this result, he further effected great reforms in the civil state of his kingdom, founded churches and schools, opened roads, built bridges, and fitted out a fleet. Another invasion by the Danes, incited by the king of Leinster, led to the decisive battle of Clontarf, in which the power of the Estlanders was finally broken. Brian was killed in his tent by a party of the flying enemy. After Brian's death internal discord reigned. The country in the 12th century was divided into the 5 kingdoms of Ulster, Leinster, Meath, Connaught, and Munster, beside a number of petty principalities, continually at war with each other. In 1152 the supremacy of the see of Rome was acknowledged by a synod of the Irish clergy, under the presidency of Cardinal Papiron, the pope's legate. A few years afterward Pope Adrian IV. conferred the sovereignty of the island on Henry II. of England, upon payment of the tribute of Peter's pence to the court of Rome. The appeal of Derinot McMurrough, king of Leinster, to reinstate him on the throne from which he had been justly driven, furnished a pretext for the invasion of Ireland, by two bands of Norman adventurers, one under Fitzstephens, in 1169, and another under Strongbow, in the same year. The country was overrun without difficulty. Henry came in person in 1171 to receive its submission. His son John was made lord of Ireland, but the country was not wholly subdued till 1210, when a charter of liberties was granted to the Irish by King John, and a few years later confirmed by Henry III. The next event of importance was the invasion of the country by Edward Bruce, who was crowned king in 1315, but was defeated by the English, and killed with 6,000 of his Scots. Toward the close of the century Richard II. twice landed in Ireland. In the reign of Edward IV. was passed the "head act," which made it lawful to kill "any persons going or coming, having no faithful man of good name and fame in their company in English apparel." Henry VII. undertook still further to reduce the country to a condition of complete dependence by ordaining that no parliament should meet without his permission, and no law be valid unless sanctioned by the English king and council. Poynings, then lord deputy, entered into the spirit of the king's measures, and carried them out with rigor. Henry VIII. took

the title of king of Ireland, although in his day only an inconsiderable portion of the country was practically subject to the English law. This reign was marked by the insurrection of Lord Thomas Fitzgerald, which ended in the total ruin of the powerful house of Kildare. Henry introduced the Protestant reformation into Ireland with as little difficulty as he had into England. A few partial disturbances happened, but nothing of national importance till the reign of Elizabeth, when the country was agitated by the civil wars of the O'Neils in the north, and the Desmonds in the south, aided by Spain. These troubles likewise ended in the ruin of the leading insurgents. James I. introduced into Ulster many Scotch and English Protestant settlers. The civil wars in England supplied the Irish Catholics with a favorable opportunity to make an attempt to overthrow the new religion. They were encouraged to this course by the pope. Accordingly, in 1641, an insurrection broke out in Ulster, which quickly spread to all parts of the island. Dublin narrowly escaped falling into their hands. Social and religious animosities alike served to embitter the contest, which was marked by great atrocities on the part of the insurgents. The English planters were everywhere put to death without mercy. No fewer than 40,000 Protestants perished in Ulster by violence. The country was a prey to anarchy till 1649, when Cromwell appeared on the scene. He took Drogheda by storm, and delivered it up to the license of his soldiery. One after another the Roman Catholic strongholds fell, till the whole country lay at his mercy, and for the first time English supremacy might be said to be established. Four fifths of the whole soil was confiscated. Once more, in 1688, the Catholics took up arms. James II., after his flight from England, presented himself in Ireland, and was received with acclamation. An army was speedily organized under the Irish and French officers whom he had brought with him. James had none of the qualifications of a general; and the superior genius of William of Orange, displayed at the battle of the Boyne, in 1690, broke the current of the ex-king's success. The battle of Aughrim followed, July 12, 1691, where the Irish met with a disastrous defeat; the fugitives retired to Limerick, and surrendered, Oct. 3, 1692, on terms which were disregarded by the victors. Renewed confiscations followed. The Roman Catholics fled the country, and those who were necessitated to remain were barely permitted to exist. The next hundred years of Irish history record little else than relentless persecution of the Catholics. Even so late as toward the close of the 18th century the penal laws were tyrannous. Catholics were not eligible to offices of trust, were not allowed to serve in the army or navy, nor to possess arms, nor to exercise many other of the rights of citizenship. They demanded "Catholic emancipation," meaning thereby a complete community of privileges. The Protestants, too, had their grievances on

various matters connected with trade and revenue. Hence the universal emancipation of nations proclaimed by the French revolution appealed powerfully to the Irish of both creeds. War with the American colonies touched their interests in various ways, chiefly by closing the markets for their linens, and by putting a stop to the emigration which was even then beginning to be developed. The British government, naturally jealous of the discontent everywhere manifest, increased its severities, suspended the habeas corpus act, dispersed meetings by force of arms, and distributed troops at free quarters upon the people. In defence the Catholics organized in secret societies as "United Irishmen" and by other names, and besought a French invasion in aid of the insurrection they contemplated. France rendered but feeble aid, sufficient, however, to encourage the outbreak, which exploded, May 23, 1798, and was carried on with rancor on the one part and sanguinary retaliation on the other. Lord Cornwallis was appointed lord lieutenant, with instructions to pursue a pacific policy; which course, although dictated as much by the exigency of the occasion as by any feeling of clemency, had the desired effect. A bill of amnesty was passed in 1799, and the country settled into the appearance of quiet. Theobald Wolfe Tone, one of the animating spirits of the insurrection, anticipated execution by suicide in prison. Government took advantage of the rebellion to hasten the legislative union of the two countries, which, despite the eloquent opposition of Grattan and his party, was effected in Jan. 1801. The articles of the act of union were: 1, that the two islands be called the United Kingdom of Great Britain and Ireland; 2, the succession to the throne to continue as existing, limited; 3, the kingdom to be represented by one parliament; 4, that Ireland be represented in the house of lords by 28 temporal peers elected for life from the Irish nobility, and in the house of commons by 100 representatives; 5, that the state churches of the two islands be united, their doctrines and discipline being one; 6, that the population of the two countries be on the same footing as regarded manufacturing, trading, and commercial privileges; 7, that the expenditure be in the proportion of Britain 15 to Ireland 2, for 20 years, afterward to be regulated by parliament; 8, that the existing laws and courts be continued, excepting that appeals from the Irish chancery be to the British house of lords. The extremes of both parties, however, were dissatisfied. An insurrection broke out in Dublin, July 23, 1803, but was speedily suppressed. Robert Emmet, the young enthusiast who led it, died on the scaffold. The outbreak had little other result than to cause the revival of harsh measures, and of agitation. For several years the question of Catholic emancipation was a standard subject of excitement. It was periodically mooted in parliament, and as regularly thrown out, for a period of nearly 20 years. In 1821 George IV. paid a state

visit to Ireland, where he was received with demonstrations of loyalty. In 1823 the question of Catholic emancipation assumed larger proportions. Daniel O'Connell was the most prominent public man from this period till his death, which occurred in 1847. Various associations were organized in aid of the ends for which the Catholics, supported by the liberal of all parties, were striving. The chief of these was "the Catholic association," of which the ostensible object was, in brief, the removal of all political and civil disabilities. Its ramifications extended throughout the country, and it derived from voluntary contributions a large revenue, known in the records of the time as "the rent." This organization exercised an important influence on the domestic political policy of the country, and may indeed be said to have effected its object, for, on April 13, 1829, the long sought act of "Catholic emancipation" received the royal assent. Sir Robert Peel, in addressing parliament on the bill, made the instructive admission that scarcely for one year since the union had Ireland been governed by the ordinary course of law, without the intervention of insurrection acts, suspension of the habeas corpus, or martial rule. O'Connell took his seat as member for Clare, and immediately proclaimed an agitation for repeal of the legislative union. The tactics that had carried the measure of emancipation were revived. The repeal association followed the Catholic. Combined with this primary object were complicated lesser issues, such as a movement against the payment of tithes. Of the 8,000,000 of population then inhabiting Ireland, only $\frac{1}{10}$, or 800,000, were members of the established Protestant church, yet tithes for its support were exacted indiscriminately from all. At length, in 1838, the obnoxious features of the tax were concealed, if not removed, by the substitution of a fixed rent charge payable by the land owners. The parliamentary reform bill, in 1832, gave to Ireland 5 more members in the house of commons; and the municipal reform act, in 1840, removed many minor governmental grievances. In 1833 some steps were taken toward improving the system of primary education, which, some years later, resulted in the incorporation of the national education society. In 1838 the English poor law system was introduced, and during the succeeding 10 years received extension and adaptations as circumstances required. The organization of the police force kept pace with these ameliorations. In 1836 it was consolidated into the semi-military arm it now is. During the progress of these events the repeal agitation was increasing, until it culminated in "the repeal year," 1843. Monster meetings, so called, were held at various places. A final one, on a yet more gigantic scale, was proposed to be held at Clontarf, but the government having forbidden it, it did not take place. In Jan. 1844, under the Peel administration, O'Connell and his fellow agitators were convicted and sentenced to a short term

of imprisonment. An appeal to the house of lords set them at liberty. The agitation did not flourish afterward. O'Connell's declining health, joined to the evidence that Britain would never consent to a severance of the two countries, caused the movement first to decline, and then to expire. A new organization had in the mean time been formed among the young Ireland party, which, in 1846, took shape under the title of the Irish confederation. In this and the succeeding year a great famine fell upon the land, and thousands perished of hunger. Parliament made successive grants in aid, amounting in the aggregate to £10,000,000. Large sums were subscribed abroad; and among other donations, a cargo of food was sent from the United States. The crops of the two succeeding years were short, but gradually plenty came again. The year 1848 was the year of revolutions. France having established a provisional republican government, young Ireland was carried away by the enthusiasm of the event. Their movements had none of the caution usually exhibited in the prosecution of similar designs. William Smith O'Brien, an Irish member of the house of commons, Thomas Francis Meagher, Richard O'Gorman, and others, constituted a deputation to solicit from the French republic countenance to the "oppressed nationality of Ireland." Attempts at open revolt, which it is unnecessary to trace in detail, followed without effect. O'Brien, arrested at Ballingarry in Tipperary county, was condemned to death for treason, as were Meagher, McManus, and O'Donoghoe. John Mitchel, editor of the "United Irishman" newspaper, was sentenced to 14 years' transportation, and others implicated fled the country. None were executed, the sentence of death having been commuted to transportation, and in most instances pardons were extended in 1856. In 1849 came into operation the act appointing courts for the sale of encumbered estates. In the same year Queen Victoria paid her first visit to Ireland, and she again visited it in 1853 to witness the great exhibition of Irish industrial products, opened at Dublin, April 12. The year 1854 was signalized by the foundation of a Roman Catholic university. The political excitements of this period were an agitation by Protestants against the governmental grant to the Catholic ecclesiastical college of Maynooth, and by the Catholic defence association in favor of perfect religious equality. "Tenant right," with other secular questions, under discussion at the same time, produced considerable effervescence, but all have been settled in a constitutional manner, and without any of that rancor and animosity that formed a frequent element of previous agitations.—The recent history of Ireland is of a different complexion from any which our sketch has yet portrayed. Political agitation has died away, and in its room has grown up an industrial activity, which is not confined to one element of prosperity. The established branches of production and commerce are tak-

ing a wider sweep. Emigration, while it has made more room for those who remained, has reacted on the country by the increased wealth and position of those who have sought fortune abroad. Social ameliorations are also making progress. The encumbered estates courts have been beneficial in many respects. The evils of absenteeism have been diminished by bringing into market, in smaller holdings, estates overburdened by debt, and shut out from improvement. Capital has thus been laid out on Irish estates which would otherwise have sought investment in England or Scotland. The race of middlemen are beginning to find their occupation gone, and with them rack-rents to disappear. A better system of agriculture has been introduced, and with it a larger demand, and consequently a better remuneration, for labor. At the same time education is expanding, while sectarian animosity is decreasing; and the hope may be indulged, that this long depressed country is now entering upon a period of substantial improvement and prosperity.—Ireland has produced some of the most successful statesmen, orators, poets, and warriors of the United Kingdom, as Burke, Sheridan, Castlereagh, Goldsmith, Moore, and Wellington. If the helplessness and poverty of many of the lower classes of her population inspire feelings of sympathy and commiseration, the brilliant qualities of mind and heart of many of the cultivated class compel respect and admiration. Many of the most accomplished women who have adorned English society were Irish by birth; and as a peculiar trait of the national character, it must be mentioned that the women of Ireland, however poor or oppressed, are as noted for their virtue as for their piety.

IRELAND, LANGUAGE OF. In 1851, according to the census of that year, the Irish language was spoken exclusively by 319,602 persons, principally in the provinces of Munster and Connaught, and both English and Irish by 1,204,688; thus for nearly one-fourth of the population of Ireland it is still a living tongue. For the relationship of this language, the reader is referred to the articles BRETON, ERSE, and GAEL. Before the introduction of the letters resembling the so called Anglo-Saxon alphabet, several other graphic systems were resorted to. Charles Vallancey ("Essay on the Antiquities of Ireland," Dublin, 1772) enumerates 5 methods, viz.: 1. The Bobeloth, attributed to the masters who assisted in forming the hypothetical Japhetic language, and the names of whose letters were: *Boibel*, chief spirit; *Loth*, sun, light; *Foran*, cunning man; *Salia*, wave, to leap; *Neigadon*, ruler; *II* (Uiria), slave (?); *Dai-bhoidh*, divine wisdom; *Teilmon*, stone of power; *Casi*, hand; *Cailep* (almost G), double hand; *Moiria*, ship; *Gagh*, ax, spear; *NGoimar*, anchor; *Ibra* (?); *Ruiben*, round head; *Aoabh*, plough; *Ose*; *Ura*, ram; *Esu*, wild beast; *Iachim*, ladder. The figures of the characters are metamorphosed ancient Hebrew signs. 2. The *Ogham-Chroab*, or augurial characters, at-

tributed to the druids. 3. The Ogham of Sullivan. 4. The imperfect Marcomannic runes. 5. The Bethluisiun na Ogma, magic letters, consisting of 1, 2, 3, 4, or 5 vertical lines under a horizontal long line which connected all letters of one word, for *b, l, f, s, n*; verticals above the horizontal line, for *h, d, t, e, g*; 1, 2, 3, 4, or 5 oblique lines crossing the horizontal for *n, g, ng, h, r*; and vertical lines crossing the horizontal for *a, o, u, e, i*. The irregular Ogham consists of arrows, above and below the horizontal thread. All these sorts of characters, and other similar contrivances, are found inscribed on various monuments in Ireland, as well as in manuscripts, on the Bembine tables, &c. Attempts have been made to trace them to Phœnicia, Egypt, Carthage, Libya, &c. The endeavors to connect the Irish language with the Punic, by means of the passage in the *Penulus* of Plautus, have been unsuccessful. Schlegel doubted the affinity of the Celtic languages with the Indo-European family. J. L. Parrot (1839) questions the existence of a Tschudic or Finnic stem, and aggregates the Livs, Letts, and Esths with the Celts. Pott and Eichhof confound Erse with Irish. The Irish surpasses the other Gaelic dialects in extent, culture, and the antiquity of its monuments. O'Connor (*Rerum Hibernicarum Scriptores Veteres*) was the first to apply sound criticism to the study of Irish antiquities. —Although the variety of phonetism is rendered indistinct by an imperfect graphic method in all Celtic dialects, the peculiar permutation of their initial sounds is a clear index of their antiquity. There are 5 Gaelic vowels, as in Italian (*a, o, u, leathan*, broad; *e, i, caol*, slim); their length being marked by a sharp accent in Irish. There are 13 diphthongs, 5 triphthongs (*aoi, eoi, iai, iui, uai*), and 13 consonants; *j, k, q, v, w, x, y*, and *z* are wanting; *c* and *g* are always hard. Aspiration, as denoted by *h* (which is never an initial), affects 9 consonants: *c, p, t, g, b, d, m, f, s* (written *ch, ph, &c.*). A dot over these letters is a substitute for *h* in many writings. The so-called *uirdhioghadh* (eclipse) affects *c, p, t, f*, and *s*, softening them into the sounds of *g, b, d, v*, and *t* respectively, and nasalizing *g, b*, and *d* into *n, m*, and *u*. Thus *gort*, garden, preceded by *ar*, our, is written *ar ngort*, but pronounced *ar nort* (without *g*). Two vowels of different breadth cannot follow one another in the same word; thus for instance the suffix *im*, I, annexed to a broad-vowelled root, requires the epenthesis of a *leathan* vowel: *dagh-a-im*, Lat. *ard-e-o*; thus the diminutive suffix *og* after *fill*, Lat. *pli-c-are*, demands *e* between: *fill-e-og*, a little fold. It is thus that many polyphthongs arose in Irish. —Gender is not very explicitly indicated. There is no neuter. In some cases *i* inserted renders masculine nouns feminine; thus: masc. *fúg*, fem. *fúisg*, Lat. *fuscis*; *dúl* and *duíl*, desire, &c. Instead of a dual, some words prefix the numeral 2, as *diucain*, two-eye, eyes; so one eye is named *leith shuíl*, half-eye, &c. Declension by flexion is very scanty, and it is indicated by various means in words ending in vowels; thus:

an chuimhne, Lat. *memoria*, *na cuimhne*, *memorie*; *fula*, *fraus*, *faladh*, *fraudis*; *ri*, *rex*, *riogh*, *regis*. The dative plural suffixes *ibh*, as *bogaibh*, Lat. *arcubus*. But words ending in consonants have more case marks, as *ollamh*, Lat. *doctor*, *ollamhan*, *doctoris* and *doctores*; *breithcamb*, Lat. *index*, *breitheamhan*, *indicis*, *breitheamhuin*, *indicis*; *snadhm*, Lat. *nodus*, plur. *snadhmána*. Adjectives are still more clearly distinguished. The comparative degree is formed by *ther*, *thir*, as *glaisither*, more blue, *duibhithir*, more black (now *duibhíde*), from *glas*, *dubh*. A similar termination gives derivatives, as *eadir*, between; *ceachtar*, both (from *ceach*, each). *Bus*, more, also points out the comparative degree. The superlative is denoted by particles.—Pronouns lack declension by flexion. They are: *me*, I; *tu*, thou; *se*, he, *si*, she, and in construction *eadh*, he; *seomh*, *sum*, *sonh* (suffixed), self; for instance: *atberth-sonh*, he says himself (now *san*, *sa*, Lat. *se*); *fein*, Lat. *se* reflexive; *inn*, *sinn*, we; *ibh*, *sibh*, you; *iad*, *siad*, they. Possessives: *mo*, my, mine; *do*, thy, thine; *a*, his, her; *ár*, our; *bhar*, *bhur*, your; *a*, their. Interrogatives: *cia*, *ca*, *ce* (c sounds always *k*), Lat. *quis*, *quæ*; *coín*, *quando*; *cuidhe*, *quare*; *cread*, *quid*; *cionas*, *quomodo*; *caes*, *unde*; *cai*, *ubi*. Numerals: *an*, *aon*, 1; *ái*, *da*, *do*, 2; *tri*, 3; *ceathar*, 4; *cúig*, *coic*, *rinne*, 5; *sc*, 6; *seacht*, 7; *ocht*, 8; *naoi*, *noi*, *noe*, 9; *deich*, *deagh*, 10; *fíched*, 20 (pr *docht*, 2×10); *tríochat*, 30; *caogat*, 50, &c., by suffixing *chat*, or *gat*; *céad*, *cet*, 100, &c. Ordinals: *príomh*, 1st; *dara*, 2d; *treasa*, 3d; the others are formed by suffixing *mad* or *adh* (English *th*). All numerals are now indeclinable, but in ancient Irish they have a mark of the dative plural; for instance: *Seiser a tríbh fíchit finn-fer*, Lat. *sex ultra (cum) tribus viginti nobilibus viris*, meaning 66 noble men. The suffix *dhe* denotes multiples, as *treidhe*, treble, &c.—The conjugation is more organic, that is, more like Sanscrit or Latin, especially in the ancient idiom, whereas now auxiliaries are used instead. The suffixes of persons are: 1st person—*m*, as *beirim*, Lat. *porto*; in the conditional, *nn*, as *beirfinn*, *portarem*; the other tenses have none; 2d person—*r*, as *daghair*, Lat. *ardes*; *meal-fair*, *fulles*, *decipies* (almost Fr. *tu feras mal*); none in the other tenses; 3d person—*dh*, as *daghaidh*, *ardet*, and in the future. Plural: 1st person—*mar*, *maoid*, as *daghamar*, *ardemus*; potential, *maois*, as *meal-fadhmaois*, *possemus fullere*; imperative, *m*, as *gonam*, *vulneramus* (in this instance the Irish surpasses the Sanscrit); 2d person—*thaoi*, *bhar*, as *dagh-thaoi*, *ardetis*; imperative, *dhe*, as *abraidhe*, *dicite*, and future *tiocfaidhe*, *venietis*; 3d person—*aí*, *id*, as *daghaid*, *ardent*; in the past, *tar*, *ttar*, as *gonatar*, *vulneracerint*, &c. In the modern forms, of the preterite for instance, only the plural preserves these terminations with the intercalated substantive verb; thus: *ceasas*, *céasais*, *ceas*, *ceas-a-mar*, *ceas-a-bhar*, *ceas-a-dar*, as *is* were I, thou, he tormented; but in the plural, *we*, *ye*, *ye*, they is (for have) tormented.

In the very ancient poem of *Fiech* and in others of the 10th and 11th centuries, the preterite has a suffix: *is*, as *fetis*, Lat. *ivit*; *set*, *sed*, *sat*, as *chraitsed*, *credidit*; *gabhsat*, *ceperunt*, and, with inserted auxiliary, *gabh-as-tar*. The future and conditional intercalate *fa*, *fi*. The characteristic of the passive voice is *r*, as in Latin. The infinitive sometimes has the suffix *n*, as *gintin* (from *gin*), Lat. *generare*; *cantuin*, *canere* (Germ. *en*); these forms are also used as substantives. The endings in dentals are attachments to roots, as *pot*, Lat. *potare* (root *po*, *bi*, as in *bibo*); *stad*, *stare* (root *sto*); *cadh*, *ire* (supine *it-um*), &c. Suffix of the participle present, *adh*, as *daghadh*, Lat. *ardens*; participle past (also of many adjectives), *ta*, *te*, *de*, as *casda*, Lat. *tortus*; *sasda*, *satiatus*; *brisdé*, *fractus*.—Among the peculiarities of the Celtic tongues, by which they differ from the Indo-European family, is the Uralo-Altaic combination of prepositions or adverbs with personal suffixes; thus, *ag* (Lat. *cum*), as (*ex*), *romh* (*coram*, *præ*, &c.), furnish *agam* (*meum*), *agad* (*tecum*), *age* (*secum*, *cum eo*), &c.; *againn* (*nobiscum*), *agaidh* (*vobiscum*), *aga* (*cum iis*), answering to the Magyar *velem*, *veled*, *vele*, *velünk*, *veletek*, *velök* (see HUNGARY, LANGUAGE OF); so *asam*, *asad* (*ex me*, *ex te*), &c. There is no shifting of vowels, as in the Teutonic languages. As to the permutation of initial consonants, the whole Celtic group has developed itself independently of its Indo-European collaterals.—See McCurtin, "Elements of the Irish Language" (London, 1728); O'Brien, "Irish Grammar" (Dublin, 1809); Owen Connellan, "Grammar" (Dublin, 1844); J. J. Marcel, *Alphabet Irlandais*, &c. (Paris, 1801); Ad. Pictet, *De l'affinité des langues Celtiques avec le Sanscrit* (Paris, 1837); W. F. Edwards, *Recherches sur les langues Celtiques* (Paris, 1844). There are dictionaries by McCurtin, with a grammar (Paris, 1732); Edward O'Reilly, with a grammar (Dublin, 1822-'40); and J. O'Brien, (Dublin, 2d ed., 1832).

IRELAND, SAMUEL, an English engraver and author, born in London early in the 18th century, died there in July, 1800. After learning engraving, he became a dealer in curiosities, scarce books, prints, &c., but ultimately turned tourist and author. He visited Holland, Brabant, France, and various parts of England, and published several illustrated works of travel and scenery, none of which have now much interest or reputation. During his visit to the vicinity of Shakespeare's home he was accompanied by his son, who was incited by the visit to commit those remarkable literary forgeries for which he is remembered. He imposed upon the elder Ireland, who published these papers as genuine relics of the past, and the discovery of the deception is said to have shortened his life. Samuel Ireland also published "Graphic Illustrations of Hogarth" (1794-'99).—SAMUEL WILLIAM HENRY, son of the preceding, born in London in 1777, died there, April 17, 1835. He was educated in France, and at the age of 16 was apprenticed to a conveynancer in his native city. Having accom-

panied his father to Stratford-upon-Avon, and noticing his enthusiasm for Shakespearean relics, he forged a deed or lease containing a pretended autograph of the poet, which he stated he had found among some old law papers. The eagerness with which his father believed this tale induced him to manufacture other documents of the same description; and he finally produced a play called "Vortigern," purporting to be by Shakespeare. It at first deceived many literateurs, and Sheridan purchased it for Drury Lane theatre, where it was produced with John Kemble in the leading part; but the total failure of the play, joined with the attacks of Malone and others, soon led to a general conviction of young Ireland's dishonesty. "Vortigern" and "Henry II.," a similar production, were printed in 1799, and the former was republished in 1832, with a fac-simile of the original forgery. Being required to show the source from which he had derived the manuscripts, he at length confessed his deception, left his father's house, and abandoned his profession. He passed the rest of his life in literary pursuits, publishing several novels which never had much popularity, "Neglected Genius," a poem (1812), &c. His "Confessions" (1805) contains a full account of his literary forgeries.

IRENÆUS, SAINT, a Gallic bishop of the 2d century. He is supposed to have been a native of Asia Minor, and was a disciple of Polycarp, by whom he was sent as a missionary to Gaul. The result of that mission was the formation of the churches of Lyons and Vienne, of the former of which he became a presbyter, and in 177, on the martyrdom of Pothinus, bishop. Later writers affirm that he suffered martyrdom; but the early ecclesiastical historians claim no such honor for him. He wrote in Greek a work against the Gnostics and Valentinians, the original of which, with the exception of a few fragments, is lost; but there is a very ancient Latin translation of it, which is probably faithful in spite of its uncouthness and barbarism. The best edition of the *Adversus Hæreses* is that of Harvey (Cambridge, 1857). The best edition of the Greek fragments is that of Pfaff (the Hague, 1715).

IRENE, a Byzantine empress, born in Athens about 752, died on the isle of Lesbos, Aug. 15, 803. She was an orphan, and 17 years of age, when her beauty and genius attracted the attention of the emperor Constantine V. Copronymus, who destined her to be the wife of his son and heir Leo. Their nuptials were celebrated with royal splendor at Constantinople in 769. Obligated by her husband to abandon the worship of images, to which she had been educated, she however gained his love and confidence, and was appointed in his testament (780) to administer the government during the minority of their son Constantine VI., then 10 years of age. She immediately manifested her zeal for the restoration of images. For this object she assembled a council at Constantinople in 786, which was interrupted by the garrison of the

capital. In the following year she called another council at Nice, in which the veneration of images was declared agreeable to Scripture and reason, and to the fathers and councils of the church. With the iconoclastic controversy is connected the struggle between the mother and the son for the supremacy. As Constantine advanced toward maturity he was encouraged by his favorites to throw off the maternal yoke, and planned the perpetual banishment of Irene to Sicily. Her vigilance disconcerted the project, and, while the two factions divided the court, the Armenian guards refused to take the oath of fidelity which she exacted to herself alone, and Constantine became lawful emperor. Irene was dismissed to a life of solitude in one of the imperial palaces, but her intrigues led to the formation of successive conspiracies for her restoration. On the return of Constantine from an expedition against the Arabs in 797, he was assailed in the hippodrome by assassins, but escaped unhurt, and fled to Phrygia. Irene, having announced to her friends that unless they should succeed in accomplishing their treason she would reveal it, joined her son and persuaded him to return to the capital. There he was surprised by her emissaries, and stabbed in the eyes, though, according to Gibbon, he survived many years, forgotten by the world. Irene succeeded to the throne, and for 5 years ruled the empire with prudence and energy. Intercourse was renewed between the Byzantine court and that of Charlemagne, and she is said to have sent ambassadors to negotiate a marriage between that emperor and herself, and thus to unite the empires of the East and of the West. - As her golden chariot moved through the streets of Constantinople, the reins of the 4 white steeds were held by as many patricians marching on foot. Most of these patricians were eunuchs, and by one of them, the great treasurer Nicephorus, she was ensnared to her ruin. He was secretly invested with the purple, and immediately arrested and banished Irene to the isle of Lesbos (802). There, deprived of all means of subsistence, she gained a scanty livelihood by spinning, and died of grief within a year. Her protection of image worship has caused her to be enrolled among the saints in the Greek calendar.

IRETON, HENRY, son-in-law to Oliver Cromwell, born in 1610, died in the camp before Limerick, Nov. 15, 1651. He was the son of a country gentleman of Nottinghamshire, and having been graduated at Trinity college, Oxford, commenced reading for the law; but his studies being interrupted by the civil war, he joined the parliamentary army. Having in 1646 married Bridget Cromwell, Oliver's eldest daughter, he was through his father-in-law's influence appointed captain of horse, and soon afterward colonel. At the battle of Naseby he was taken prisoner, but escaped. Ireton was one of the most active in compassing the death of the king, and signed the death warrant. Under the protectorate Cromwell made him lord deputy of Ireland, in which capacity he

acted with much administrative vigor, and reduced the greater part of the island to obedience. He died of the plague. His body was carried to London, and, after lying in state at Somerset house, was buried in the chapel of Henry VII. in Westminster abbey. On the restoration his remains were exhumed, exposed on a gibbet, and burned by the hangman at Tyburn. The royalists denounced him as dark, treacherous, and hypocritical; his friends eulogized his sanctity and ability. A pension of £2,000 from the estates of the duke of Buckingham, which he had refused in his lifetime, was settled by the commonwealth on his widow, son, and 4 daughters.

IRIDIUM (Lat. *iris*, rainbow), a metal so named from the colors exhibited by its solutions; symbol, Ir.; chemical equivalent, 98.8. It was discovered by Descotils in 1803, and by Smithson Tennant in 1804. It occurs native with osmium, platinum, and rhodium, in alloys of various proportions of these metals. An alloy of $\frac{1}{3}$ platinum and $\frac{2}{3}$ iridium has been met with in octahedral crystals whiter than platinum, and of specific gravity 22.66. When native platinum is dissolved in nitro-hydrochloric acid, black scales remain behind, which are composed of iridium and osmium. These metals may then be separated by one of the methods in use, and the iridium is obtained in a gray metallic powder, resembling spongy platinum. This, being infusible by the oxyhydrogen blowpipe, and neither malleable nor ductile, is rendered hard and compact, so that it can take a good polish, by moistening it with water, compressing it lightly at first with filtering paper, then with force in a press, and finally calcining it at a white heat. The metal obtained is porous, of specific gravity not exceeding 16. By strong ignition it becomes white and brilliant like platinum, but is more refractory in resisting the effects of heat and of the most powerful acid solvents. It has been fused only by a large voltaic battery. It oxidizes when heated to redness with nitre or hydrate of potash; it may also be made to unite with chlorine; and when heated in the flame of a spirit lamp it absorbs 19.83 per cent. of carbon. Small grains of iridium containing a little platinum are picked out from the grains of the latter metal, and from their extreme hardness are found to answer an excellent purpose for the nibs of gold pens.

IRIS, in Greek mythology, a daughter of the sea god Thaumas, and of the oceanide Electra, and sister of the Harpies. According to some writers she was a virgin; others make her the wife of Zephyrus and mother of Eros. She was the personification of the rainbow, and also messenger of the gods.

IRIS, in botany, the generic name of a number of beautiful plants, belonging to the natural order *iridaceæ*. The plants of this order are endogenous, having no stem, but instead a creeping rootstock (*rhizoma*), or else a sort of flat tuber (*cormus*), equitant leaves, 3 stamens, and an inferior ovary. They are represented equally in the temperate and hotter regions of

the globe. Of the garden sorts of iris, the most common are the large blue-purple flower-de-luce (*iris sambucina*), the white or pale lilac (*I. Florentina*), the golden yellow (*I. pseudacorus*), and the dwarf vernal (*I. pumila*). These have strong, fleshy rootstocks or tubers, running just below the surface of the earth, and pieces of these rhizomes readily produce new plants. In the meadows of New England and of North America are found the blue flag (*I. versicolor*) and the prismatic iris (*I. Virginica*, Linn.); the crested dwarf iris (*I. cristata*), a very beautiful species, is found wild in the mountains of Kentucky and southward. There are several species of iris with bulbous roots or stems, and highly ornamental, such as the Spanish iris (*I. xiphoides*) and the Persian iris (*I. Persica*), with exquisitely scented blossoms of an elegant pearly whitish hue, admirably adapted to forcing in pots for the drawing room. The properties of the iris are various, almost every species possessing something intrinsic. The orris root of the shops is the dried rootstocks of *I. Florentina*; the powder from the roots of *I. pseudacorus* is used as a snuff, producing copious discharges from the nose; the root is also astringent, and may be employed in making ink or in dyeing black; the fresh juice of some species proves to be cathartic, and even good in curing dropsies. The roots of a Siberian species (*I. dichotoma*), according to Pallas, are eaten; and Thunberg affirms that the Hottentots roast and eat the roots of *I. edulis*. (See also CROCUS.)

IRISH SEA, that part of the Atlantic ocean which lies between Scotland on the N., England on the E., Wales on the S., and Ireland on the W. It is between lat. 53° 40' and 54° 30' N., and long. 3° and 6° W. It contains the isle of Man, Anglesea, Holyhead, and a few islets. Carnarvon and Morecambe bays, and the estuaries of the Dee, Mersey, and Ribble, are its inlets in England; Solway frith, Wigtown, and Luce bays, in Scotland; and Dundrum, Carlingford, Dundalk, and Dublin bays, in Ireland. The principal rivers flowing into it from Great Britain are the Esk, Ribble, Mersey, and Dee; from Ireland, the Liffey and the Boyne.

IRKOOTSK, or IRKUTSK, a government of Asiatic Russia, in the S. part of E. Siberia, bordering on Mongolia; area, 507,056 sq. m.; pop. in 1851, 294,514. The Altai mountains form its S. boundary. The surface is elevated, the general level of the N. and E. portions being from 2,500 to 3,000 feet, and that of the S. from 1,200 to 2,000. It is watered by the Angara, Lena, and a number of smaller rivers, and contains Lake Baikal. It is rich in various minerals, among which are gold, silver, copper, and iron. Extensive forests occupy a large portion of the country, and agriculture is prosperously conducted, barley and rye being the principal crops. —IRKOOTSK, the capital of the above government and of E. Siberia, is situated on the right bank of the river Angara, about 40 m. from its source in Lake Baikal; pop. in 1857 estimated

at 20,000. It lies on both sides of the mouth of the Ushakovka, a small tributary of the Angara, and opposite the confluence of the Irkoot with the latter river. It is well built, paved, and lighted. The principal streets run parallel with the Angara, on the banks of which are the exchange, the admiralty offices and dockyards, the governor-general's palace, and various government factories and workshops in which convicts are employed. The centre of the city is occupied by a handsome public square, on which front the houses of many of the functionaries, and the guard house. The school of medicine, the gymnasium, and the depot of the Russian American company, are fine and spacious edifices. The gymnasium has a library of 5,000 volumes. There are many public schools, a high school for navigation, a female orphan school, a theatre, and a good bazaar. The city is fortified, and has a citadel. It contains 15 churches, and numerous convents and hospitals. Nearly all the houses are of wood, neatly planked, and painted yellow or gray. The principal manufactures are woollens, linens, leather, glass, and soap. The trade of Irkootsk is important, being estimated at \$4,000,000 a year. It is the great commercial entrepot between the Chinese empire and European Russia, exporting to the latter tea, rhubarb, fruits, porcelain, paper, silk, &c., in exchange for various European goods. It has a great fair in June.

IRON, the most useful of all metals, and the most bountifully provided in variety and general distribution of its ores. It is applied to the greatest number of purposes, and consumed in larger quantities than all other metals combined. The most massive metallic works are made of it, and also the most delicate instruments, as the hair springs of watches, in which the metal attains a far higher value, weight for weight, than that of gold itself. No other material is so enhanced in price by the valuable qualities imparted to it by labor. A bar of iron worth \$5, it is stated, is worth \$10.50 when made into horse shoes, \$55 in the form of needles, \$3,285 in penknife blades, \$29,480 in shirt buttons, and \$250,000 in balance springs of watches. In its pure form, called wrought iron, it is soft and malleable when heated, and is then beaten by the hammer into any desired shape, rolled into thin plates, or drawn out into fine wire of the greatest tenacity. Not only is it ductile like wax in this condition, but it also possesses the property of welding or of uniting with another piece brought to a white heat, and the two by beating become incorporated as if originally but one. Combined with from $\frac{1}{4}$ to $\frac{5}{8}$ or $5\frac{1}{2}$ per cent. of carbon, it is the fusible cast iron, not malleable, but easily melted and susceptible of taking and retaining the minutest forms of the mould. With a proportion of carbon varying from $\frac{1}{4}$ to $1\frac{1}{2}$ per cent. it is steel; its malleability and property of welding are restored, while it still continues fusible at degrees of heat easily attained, and moreover possesses a new property of acquiring any desired degree of

hardness as it is heated and chilled in the process of tempering. With these varieties of qualities, each of which is variously exhibited, rendering the metal adapted to a multitude of applications, giving it in fact the valuable properties of many metals, the uses of iron may well be innumerable, and the methods of working it too numerous and complicated for more than a very general notice. Some of the processes connected with the working of the metal, and some of its ores also, are described in other portions of this work under their own heads; and for a portion of the details omitted here the reader is referred to the articles BLOOMARY, BLOWING MACHINES, FORGE, FOUNDERY, FURNACE, HAMMER, HEMATITE, METALLURGY, and STEEL.—As observed in the article BRASS, the use of this alloy or of copper is believed to have preceded that of iron. Yet in the earliest notices of metals both are mentioned together; thus Job xxviii. 2: "Iron is taken out of the earth [marginal reading, "dust"], and brass is molten out of the stone;" Gen. iv. 22: "Tubal Cain, an instructor of every artificer in brass and iron;" Deut. viii. 9: "a land whose stones are iron, and out of whose hills thou mayest dig brass." Frequent mention is made of iron in the later books of the Old Testament; and some of the references indicate very clearly that the metal was the same as our iron, and worked in furnaces. In Jer. xv. 12, the question, "Shall iron break the northern iron and the steel?" seems to imply an acquaintance with the excellent quality of iron and probably of steel, for which the ores of Chalybia on the borders of the Euxine, to the north of Palestine, were famous in ancient times. The word translated steel, however, is elsewhere translated brass. From other evidences the use of iron is traced back to very remote periods. Wilkinson states that, according to the Arundelian marbles, iron was known 188 years before the Trojan war (about 1370 B. C.). Its use is mentioned by Homer (*Iliad*, xxiii. 261, and *Odyssey*, ix. 391), the descriptions seeming to be especially adapted to the peculiar qualities of malleable iron; but cast iron does not appear to have been known to the ancients. Thrasyllus, as Wilkinson also states, supposed that iron was known before the Trojan war, or indeed 114 years previous to the foundation of Troy (1537 B. C.). "Iron and copper mines are found in the Egyptian desert, which were worked in old times; and the monuments of Thebes, and even the tombs about Memphis, dating more than 4,000 years ago, represent butchers sharpening their knives on a round bar of metal attached to their apron, which from its blue color can only be steel; and the distinction between the bronzed and iron weapons in the tomb of Remeses III., one painted red, the other blue, leaves no doubt of both having been used (as in Rome) at the same period. In Ethiopia iron was much more abundant than in Egypt." ("Ancient Egyptians," vol. ii. p. 155.) From the high value attached to iron in the allusions to it in the *Iliad* and *Odyssey*, it would

appear to have been extremely rare; yet in Sparta, at about the time of Homer, it must have been abundant; for by the laws of Lycurgus the Spartans were restricted to its use for coins, and gold and silver were not allowed to be introduced for this purpose. Yet some notion may be formed of its value at that time by the assertion of Plutarch, that it required a cart drawn by two oxen to carry the small sum of 10 minæ. In the time of Æschylus (born 525 B. C.) the Chalybes were famous workers in iron, and Chalybia was called the mother of iron. Aristotle speaks of the locality and the method of working the ores, in his treatise upon hearing; see also his "Meteorology," iv. 6. With the Greeks *chalybs* became the name for the best of steel, and the term is still applied in our own language to ferruginous waters and medicinal preparations. Strabo, writing about the time of the commencement of the present era, speaks of the iron mines of Chalcis and Eubœa as being almost exhausted by the extensive mining operations of the Athenians. He also mentions iron being brought from Great Britain, and speaks of the mines of Elba, famous to this day, then called by the Greeks, from the blazing fires of its iron works, *Æthalia*. Karsten supposes these mines had been worked full 700 years B. C., and that the ancient Britons knew how to work iron many centuries before the Christian era. Pliny the Elder devotes a chapter of his work on natural history (lib. xxxiv. 39) to an account of iron, its uses and manufacture. He speaks of an iron statue of Hercules by Alcon at Thebes, and bowls of iron in the temple of Mars at Rome; of different qualities suited to different purposes; of some furnaces producing bars, and others metal which was cast (?) into anvils and hammer heads; and mentions the mines of Elba, the Serican iron, the Parthian and the Norican. The last, from some part of the country now included in Austria, Styria, and Carinthia, is also alluded to by Ovid (*Met.* xiv. 712), in the line: *Durior et ferro, quod Noricus excoquit ignis*. Pliny was aware of the magnetic property of iron, and speaks of an iron statue of Arsinoë, sister of Ptolemy Philadelphus, which it was proposed to suspend in a temple by the equilibrium of several magnets acting against gravity. It is not probable from these accounts that the Romans possessed the knowledge of cast iron; and whether they made steel or wrought iron by their processes was, as Karsten supposes, a matter of chance. Some, however, believe that the ancient descriptions indicate the manufacture of cast iron, and a small cast iron statue of Hercules is stated by Count de Caylus to have been found in the museum of the Villa Borghese, of Etruscan origin, and supposed to have been made in the 3d or 4th century B. C. But if this be so, it was most likely an accidental product of the wrought iron process. The methods in use by the ancients were without doubt similar to these now practised by the rude nations of Asia and Africa, whose customs change little

in the lapse of ages. By these the rich ores are deoxidized in open fires, into which the air is blown by hand bellows. Homer speaks of the furnace in which the shield of Achilles was forged as being blown by 20 pairs of bellows. The small quantity of iron ore laid upon the coals is reduced, and the reduced metal collects together to form a loop, and at the close of the operation this is taken out and hammered upon an anvil, the impurities separating in a semi-fluid cinder.—During the first 7 centuries of the Christian era the manufacture of iron attracted little attention. In the early part of the 8th century the mines of Styria (the Noricum of the Romans) and the Erzgebirge were opened; and in the 9th century the manufacture was spread further north, and also into Bohemia. It thence spread into other countries; and ancient slag heaps have been met with and described in so many places, as in Sweden, Norway, Finland, at Rouen, Dieppe, &c., in France, and in Silesia, overgrown with trees 6 centuries old, that it is certain the manufacture direct from the ores must have been very generally practised throughout Europe. Yet improvements in the processes appear to have been introduced very slowly, though both iron and steel were most skillfully worked into various articles in Holland. Furnaces called *Stücköfen*, the *fourneaux à masse* of the French, of unknown origin, were in use. These were about 10 feet high, and were charged with ore and coal at the top, in alternate layers in the larger furnaces. The blast was introduced below, and the slag was drawn off with more or less cast iron attached to it. But the chief portion of the iron, collected in a mass or *Stück*, remained in the bottom of the furnace; this was metallic iron more or less steely by absorption of carbon, and accompanied with liquid cast iron. A furnace of this kind was not adapted for lean ores; and a new form was introduced, first it is supposed on the Rhine, which by greater height (20 to 25 feet) allowed the earthy portion of poor ores to melt down in glassy cinders, and flow out at the bottom. These furnaces were called *Flussöfen* or *Blauöfen*. They differed from the blast furnaces, which succeeded them, by a greater drawing in of the lower portion called the crucible or hearth, and in being entirely closed all around this portion except a small circular aperture, which was kept shut, and only opened at the time of running off the metal or cinder. With these furnaces cast iron was first regularly made. The earliest notices of this production are of guns being cast in one piece in the 15th century, and of iron stoves cast in Alsace in 1490. Yet George Agricola, in his work *De Re Metallica* (1550), which contains the first treatise devoted to the manufacture of iron, makes no mention of this form of furnace, although he describes the *Stücköfen*, and the open fire or low furnaces of the nature of a bloomery or Catalan forge. The high blast furnace was the next improvement, and a necessary result of increasing the height and capacity of the *Flussöfen*. The invention is

attributed to the Belgians or Walloons, and was introduced into England, it is believed, not before 1558, although cannon were made there of cast iron by John Owen in 1535, and by Ralph Hoge in 1540. The new smelting furnaces were soon found to be well adapted for working over the rich cinders of the old Roman and Danish forges; and in the forest of Dean these were dug up in such abundance, often from beneath forests of oak, that they continued to keep in operation, it is computed, some 20 blast furnaces for 200 years. Other European countries slowly adopted this great improvement. Even the *Flussöfen* was not introduced into Saxony till 1550, and high blast furnaces not till a century later in this iron district or in Brandenburg; in Silesia not indeed till 1721, after their adoption in North America. In England the most rapid progress continued to be made in the manufacture. About the year 1600 from 2 to 3 tons of pig iron were made in a day from a single charcoal furnace. In 1612 a patent was granted to Simon Sturtevant for smelting iron with bituminous coal; and the next year another patent for the same purpose to John Ravensson, who professed that he could make a ton of pig iron with a ton of coal. Dudley was more successful with his patent, obtained in 1619; but his success excited opposition, his patent was taken away, and his works destroyed. More than a century passed away before this important improvement was finally established. The progress of the manufacture and business will be again referred to in treating the statistics of iron under the head of IRON MANUFACTURE. In 1760, the coke furnaces from their increased size requiring more blast than could be afforded by the wooden bellows in use, Smeaton constructed for the Carron iron works in Scotland blowing cylinders of cast iron. In 1778 they were in general use, and commonly impelled by steam engines, the application of which to this manufacture greatly contributed to its extension. In 1784 was patented the puddling process, invented by Henry Cort, in which pig iron is rapidly and economically converted into wrought iron by separating the carbon and removing other impurities. The value of this invention was soon proved to be incalculable, but the inventor was poorly compensated. (See CORR.) The next important invention was the hot blast, first applied to the Muirkirk furnaces by Mr. Neilson. Dr. Ure gives the date of this as 1827, and of the patent 1828. In other English works the patent is often referred to the year 1824. Alexander ("Report on the Manufacture of Iron," p. 62) says the patent was enrolled in March, 1829, and quotes a letter written by the inventor to Mr. Telford, referring to this date. Neilson was more successful than Cort in securing to himself the benefit of his discovery; as damages for the infringement of his patent by the Gartsherrie iron works in Scotland he received a check from the proprietors on the bank of England for £150,000. Until 1837 the hot blast oven was heated

by a separate and independent fire, and the economy of fuel incident to its use, though very considerable, was reduced by that consumed in this fire. At this time M. Faber du Four, director of the royal iron works at Wasseraelfingen in Würtemberg, perfected his method of applying the waste gases that escaped from the top of the furnace to heating the blast, and also to generating steam for the engine, an improvement that has proved of great importance to the blast furnaces of the United States and the continent of Europe, and which, first successfully introduced in anthracite furnaces by C. E. Detmold in 1841, has since been applied to nearly all iron furnaces, saving from \$2 to \$3 per ton in fuel; but in Great Britain it is comparatively little appreciated. The last great improvement in the manufacture is the use of anthracite for fuel. This was attempted as far back as the year 1820 at Mauch Chunk, Penn., where a furnace was built specially for this purpose by some members of the Lehigh coal and navigation company (see Johnson's "Notes on the Use of Anthracite in the Manufacture of Iron," 1841, p. 13); also in 1827 at Kingston, Mass. (see *ANTHRACITE*, vol. i. p. 646); and in 1827-'8 at Vizelle on the borders of France and Switzerland. The extensive experiments made at the last named place are fully detailed in the *Annales des mines*, vols. iii. and iv., 3d series, and an account derived from this source is also given of them by Johnson. In Dec. 1833, the Rev. Frederic W. Geisenhainer of Schuylkill co., Penn., after experimenting on the treatment of anthracite with the hot blast, obtained a patent for the same; and in 1835 he made iron in a small stack near Pottsville, which he had erected for the purpose, the first no doubt made with hot blast. In 1837 Mr. George Crane of Great Britain, who had just succeeded in effecting the same object in Wales, applied for letters patent in the United States; but he failed to establish his claims, and after several years' litigation bought of the executors of Dr. Geisenhainer (who had died in 1838) the right to use the patent that had already been issued to him. He then patented a trivial improvement in the process; but the heirs of Dr. Geisenhainer made the right public, and hence anthracite has been freely used in the United States in the manufacture of iron without patent charges or fees. The extent to which the manufacture has been carried in Great Britain and other countries will be noticed in the accounts of the statistics of the trade.—It is not known when or where iron was first made in the United States; but the attention of the first settlers of the British colonies was very early directed to the iron ores which they met with. Salmon states, on the authority of Beverly's "History of Virginia" ("Modern History," 1746, vol. iii. pp. 439 and 468), that "an iron work was set up at Falling Creek in James river, where they found the iron ore good, and had near brought that work to perfection. The iron proved reasonably good; but before they got into the body

of the mine the people were cut off in that fatal massacre [of March, 1622], and the project has never been set on foot since until of late; but it has not had its full trial." Salmon also refers to the representations of the board of trade to the house of commons in 1732, as containing notices of the iron works in operation in New England. This and other manufactures were at that early day regarded with great jealousy by the merchants of London. Col. Slute, "governor of the Massachusetts Bay," had stated to the board, "that there had been for many years some iron works in that province, which had afforded the people iron for some of their necessary occasions; but that the iron imported from Great Britain was esteemed much the best, and wholly used by the shipping; that the iron works of that province were not able to supply the 20th part of what was necessary for the use of the country." Gov. Belcher also stated, "that there are several forges for making bar iron, and some furnaces for cast iron (or hollow ware), and one slitting mill, the undertaker whereof carries on the manufacture of nails." Col. Dunbar, surveyor-general of his majesty's woods, sent to the board on June 4, 1731, samples of edged tools made in New England. In his letter he said: "They have 6 furnaces and 19 forges for making iron in New England." The governor of Rhode Island informed the board: "There are iron mines there, though not a fourth part of iron enough to serve their own use;" but he takes no notice of any sort of manufacture set up there. A letter "from a considerable merchant of New England" also speaks of iron mines wrought in Rhode Island and Providence plantations, "and turned to a good account; for they make many of their own edged tools and implements of husbandry." These mines were probably of bog ores, and situated near the coast; for from other sources it appears that a blast furnace was built in 1702 by Lambert Despard at the outlet of Mattakeeset pond in Plymouth co., Mass., and a number more were afterward set in operation to work the bog ores of that district. Their operations are described in the "Collections of the Massachusetts Historical Society," 1804, by James Thacher, M.D., who was himself engaged in the manufacture. Alexander gives the year 1715 as the epoch of furnaces in Maryland, Virginia, and Pennsylvania. He states that in 1717 iron was exported to England, and in 1719 an act was proposed in the house of lords to prevent the erection of rolling or slitting mills in the American colonies, which act was finally passed in 1750. About the year 1724 Gov. Spotswood of Virginia had a furnace for making iron above the falls of the Rappahannock river, noticed by Hugh Jones in his "Present Condition of Virginia," published at that time. Gov. Spotswood founded a town called Germanna, and regarded himself as the first person who had erected a regular furnace in the United States. See also "Byrd's Progress to the Mines," in 1732, which, with Jones's work above refer-

red to, is noticed in Howe's "Historical Collections of Virginia" (1845), pp. 475 and 476. —Pure iron is a bluish gray metal, susceptible of a high polish, of granular, crystalline, or fibrous structure, and when exhibiting the last breaking with a hackly fracture. It is remarkably ductile, of greater tenacity than any other substance, of hardness 4.5, and of specific gravity 7.3 to 7.8. Its chemical equivalent is 28. It tends to crystallize, when long kept at a red heat, in cubes and octahedrons. When heated to a high degree of redness, the separate particles agglutinate and form a spongy mass; this occurs as they are revived in the process of reducing its ores, and on this property the methods of obtaining it direct from the ore in part depend. At very high temperatures the reduced metal however, exposed to the action of carbon, combines with this element, and then assumes the brittle and fusible character of cast iron, a compound which melts at various degrees of temperature according to the qualities and proportions of foreign matters it may contain, but ranging, according to Scheerer, from 1500° to 1700° C., while that of iron by the same authority is 2100° C., and that of steel from 1750° to 1850° C. Iron is attracted by the magnet, and becomes itself magnetic by induction; but if pure it loses its polarity when removed from the magnet. Steel that has once acquired the property retains it permanently at ordinary temperatures. Cast iron also exhibits a susceptibility to magnetism; but a remarkable exception to this rule has been observed by Mr. C. E. Detmold of New York, in the very large crystals of the pig metal produced by the New Jersey zinc company from Franklinite, and containing a maximum quantity of carbon and considerable manganese. Iron slowly absorbs oxygen from moist air and from water, if carbonic acid be present, and a film of oxide, called iron rust, which always contains some ammonia, forms upon its surface; and this film admitting the passage of air, the process rapidly goes on beneath the scale. This injurious effect may be prevented by placing in contact with the iron a more positive metal, as zinc. (See GALVANIZED IRON.) It is hastened by contact with a more negative metal, as lead or copper; hence the rapid rusting of iron posts, &c., secured in lead sockets, and the corrosion of steam pipes furnished with collars or other attachments of lead or copper. Even the carbon in cast iron acts as a negative element, and causes some qualities of cast iron to corrode rapidly in sea water and become converted into graphite, the iron chiefly going off in solution. When iron long kept under water is reduced to powder, it tends to become red hot and ignite combustible substances in contact with it. Particles scraped from a corroded gun barrel have been observed to ignite the paper in which they were wrapped. The French chemist Lemary observed as far back as the year 1670 the tendency of moistened particles of iron to ignite. Iron is readily dissolved in dilute acids, hydrogen escaping from the decomposed water; but

if the surface of pure iron be first oxidized, it is brought into the condition called passive by Schönbein, who has particularly investigated the phenomenon, and it may then be kept for any time in nitric acid and various saline solutions without change. Iron burns rapidly in the open air at a high temperature, as seen in the particles struck off by the hammer from a heated mass upon the anvil; and when the spongy mass of pure iron obtained by decomposing the oxide by hydrogen at a heat below redness is exposed to the air, it takes fire spontaneously at ordinary temperature. The structure of malleable iron is liable to undergo changes by movement of its particles induced by constant jarring motion or other causes, so that its strength is materially affected. Naturally of granular texture, iron is made fibrous and tough as it is wrought under the hammer. But however strong it may be made, constant use accompanied with a jarring motion, as in the case of car axles, causes its particles to return to their crystalline condition and the mass to become brittle. Hollow axles, as discovered by Mr. Connel, an English engineer, are not liable to this change, and moreover have the advantage of greater strength with less weight. A large anchor that had been stored at Woolwich dock more than 100 years, supposed to be made of strong iron, was recently broken with great ease in testing it, the fracture presenting large crystals. The change in this case is supposed to have been induced by magnetic influences, the iron remaining long in the same position. Iron is affected in the same way by repeated heating and sudden cooling. Wrought iron furnace bars lose their strength also by continual use; and it has been noticed that in working bars of the metal under the hammer, a few blows struck upon any part of the bar that has cooled down to a low red heat will sometimes entirely change the texture of this part.—Several qualities of malleable iron are known in commerce. The pure metal is very rare, carbon being always present, and generally some other foreign substances, as phosphorus, sulphur, silicon, arsenic, &c., that injuriously affect its quality. The nearest approach to purity in which it is obtained is in the fine wires used for pianoforte cords and the fine teeth of mill cards. The old cards furnish the best source of pure iron for chemical purposes. The various qualities of malleable iron are designated as strong iron, red short, and cold short, of all which there are varieties. The first may be worked hot and cold without risk of fracture, and is applied to purposes requiring the greatest strength, as the harder varieties for chain cables, boiler plates, &c., and the softer and more ductile for horse shoes and nails, wire, &c. Red short iron is brittle at a red heat, a quality commonly due to the presence of sulphur. Three parts of the latter in 10,000 are sufficient to destroy the welding property of iron. Cold short iron is brittle when cold, though it may work well while hot. This effect is commonly caused by the presence of

phosphorus. Silicon also has a similar tendency, and iron containing much of it is of a crystalline structure and very weak. These various qualities render it a matter of consequence to try the iron, before selecting it for special uses, by several tests, as by working it under the hammer at different temperatures, bending it hot and cold, nicking it with the cold chisel under different conditions, &c. Malleable iron begins to acquire the peculiar property of steel—hardness induced by tempering—with less than $\frac{1}{2}$ per cent. of carbon. With 0.6 per cent. the character is decidedly steely, especially if the iron be of poor quality. Good steel commonly contains 1 to 1.5 per cent. of carbon; with 1.75 per cent. it can be welded only with great difficulty; and with 2 per cent. it cannot be worked under the hammer—the metal is in fact cast iron. The maximum percentage of carbon which iron can be made to dissolve was found by Karsten to be 5.3 per cent., and this probably constitutes a definite compound of 4 atoms of iron with 1 atom of carbon. The product is silvery white, exceedingly hard and brittle, of laminated structure, of easy fusion, and very fluid when melted. It is a product of perfect reduction and carbonization, effected when the furnace works well, and produces a cinder free from iron. Another variety of white cast iron is produced when the furnace is overcharged with ore and the reduction is incomplete, as appears from the black, heavy, ferruginous cinder. This variety contains a smaller amount of carbon, and its properties of brittleness and hardness are such that it is not used for remelting or for foundry purposes, but it is adapted only for conversion into wrought iron; it is hence known as forge pig, and also as high iron and white iron. When fused cast iron is allowed to cool very slowly from a high temperature, the carbon tends to separate from its chemical union with the iron, and becomes visible in the form of black spangles, which are graphite, disseminated through the mass. This is variously exhibited in different qualities of cast iron, and those most remarkable for this conspicuous form of carbon are in consequence of it of a dark gray color. These are produced when the furnace is working at high temperatures and with large combustion of fuel, and running the most perfect glassy cinder. Several varieties are recognized, and they are designated as foundry irons from their being the best adapted for castings; they are also known as Nos. 1 and 2 and gray irons. Many of them are so remarkable for their softness as sometimes to be cut with a knife, and some pigs, especially of No. 2 iron, are so strong as to defy all attempts to break them by the heaviest blows of a sledge hammer. Between the gray and white qualities are the mottled irons, which consist of the two former intimately intermixed, but yet in distinct grains. The properties of these are intermediate between the white and gray irons, but approach more nearly those of the former, and the lighter in shade they are the

harder and less tough. How far the very great differences in the qualities of cast iron are dependent upon the slightly different proportions of carbon present is far from being understood, and no certain methods are yet known by which the proportions of carbon can be determined with exactness, when this occurs chemically combined with the iron. Nor has it been found practicable in the manufacture to produce just such qualities of iron as may be desirable in all cases, though within certain limits the founder possesses a decided control over the nature of the products. But individual furnaces or those of the same localities are generally distinguished by marked peculiarities of their iron, owing it may be to peculiarities in their ores or fuel, which cannot be imitated elsewhere. A striking example of this is seen in the "Scotch pig," a weak foundry iron, but very soft and running very fluid—qualities which render it of great value to mix with other irons. This iron, being largely and cheaply produced in the west of Scotland, is imported in immense quantities into the United States to be used in almost every foundry, not merely along the seaboard, but throughout the interior even as far as Detroit and Chicago. Better and more valuable qualities of pig iron are produced in the United States, but none in large quantity of which the character is so uniform and well known; for this reason Scotch pig has been made the standard by which the price of iron is quoted. Dark gray irons of great strength are made in many of the hematite charcoal furnaces of the United States, and of late years in those also using anthracite. They are the most valuable qualities, but they cost more fuel and involve a greater expenditure of time in the production than the high irons, and the latter may moreover be obtained from poor ores and mineral fuel that will not make the best gray iron.—The qualities of cast iron are variously affected by foreign substances which enter into combination with the iron, and from some of which, as phosphorus and silicon, the metal is probably never entirely free. Phosphorus, while it renders iron brittle, imparts fluidity to the cast metal, and in small quantity is beneficial for fine ornamental castings, in which great strength is not important. (See BOG ORE.) Silicon is contained in largest quantity in foundry iron, and its effect is to lessen the tenacity of the articles made from it. Manganese tends to produce high irons, and those of laminated structure generally owe this property to its presence in the ore. Bar iron is rendered harder by it, and better adapted for the manufacture of steel. The oxides of the two substances have intimate relations with and replace each other in ores, possibly also the substances themselves. Titanium renders iron more difficult to fuse, and its presence in the ores seriously interferes with their reduction. It does not appear to enter into combination with the iron, nor to have any injurious effect upon its quality; possibly it increases its hardness.—Iron exhibits the appearance of great closeness of texture,

and in density it ranks among the most solid bodies. This quality, however, varies in the cast irons from 7.1 to 7.5. That it is a porous material was shown in a remarkable manner in the operations of the hydraulic pump used at the Menai straits bridge, when the water was made to penetrate by the pressure through the cast iron until the pores were stopped by pumping in oatmeal. In the article *CANNON* it is also stated that water is known to penetrate 4 inches thickness of the metal, when the pieces are proved by hydrostatic pressure. The varying density of cast iron allows of no precise rule for estimating its weight; but in practice this is conveniently and approximately arrived at by calculating $\frac{1}{4}$ lb. to the cubic inch.—The strength of iron is variously exhibited according to its several kinds, and according to the varying conditions of the same qualities. Wrought iron opposes a greater resistance than any other substance to a force applied to draw it asunder. The following table presents a partial report, furnished to the British association, of experiments which were made upon the strength of iron in 1859–60, under the direction of Messrs. Robert Napier and sons. The full returns of these experiments were not completed in time to appear in this article; they are to be published with great minuteness of detail in the "Transactions of the Institution of Engineers" in Scotland. The experiments were all made with loads applied gradually, and each result is the mean of at least four, and sometimes of many more experiments:

Kind of iron.	Tenacity in lbs. per sq. in.	Ultimate extension in decimals of length when on the point of being torn asunder.
A. IRON BARS.		
Yorkshire, strongest.....	62,386	0.256
" weakest.....	60,075	0.205
" (forged).....	66,392	0.202
Staffordshire, strongest.....	62,231	0.222
" weakest.....	56,715	0.225
West of Scotland, strongest.....	64,795	0.173
" weakest.....	56,655	0.191
Sweden, strongest.....	48,292	0.264
" weakest.....	47,835	0.273
Russia, strongest.....	56,805	0.153
" weakest.....	49,564	0.133
B. IRON PLATES.		
Yorkshire, strongest lengthwise.....	56,005	0.141
" weakest.....	52,000	0.132
" strongest crosswise.....	59,515	0.093
" weakest.....	46,221	0.076
C. STEEL BARS.		
Steel for tools, rivets, &c., strongest....	132,900	0.054
" " weakest.....	101,151	0.103
" other purposes, strongest.....	92,015	0.153
" " weakest.....	71,456	....
D. STEEL PLATES.		
Strongest lengthwise.....	94,259	0.0571
Weakest.....	75,594	0.1982
Strongest crosswise.....	96,308	0.0964
Weakest.....	69,052	0.1964

With a load of one ton to the square inch of area of section the best bars are elongated .000082, and will bear an extension of .000714 without injury. A cable of small wires admits of a greater extension, and this increases as their diameter

diminishes. Iron wire $\frac{1}{30}$ of an inch in diameter has borne a load equivalent to 60 and even 90 tons to the square inch without breaking. The tenacity of Russian bar iron is rated at about 27 tons to the square inch, which is about 3 times that of the best cast iron. As compared with other materials, a rod of wrought iron is estimated by Mosely to have tenacity equivalent to $1\frac{1}{2}$ such rods of silver or of copper; to 2 of gold; 3 of cast iron or of boxwood; 5 of pine, oak, or beech; and 7 of mahogany. Platinum alone possesses nearly the same strength. In 1852 the following results were communicated to the newspapers of New York of trials of different kinds of bar iron: best Swedish bar, 72,804 lbs.; inferior do., 53,224; best English bar, 61,660; inferior do., 55,000; American Fränk-linite iron, 77,000. At Troy, N. Y., the manufacture of puddled steel after the German process has been recently introduced, by which it is stated bars are obtained of tenacity equal to 100,000 lbs. per square inch; and it is expected that bars of similar strength will hereafter be regularly supplied for the market.—Cast iron is the best adapted of all materials in common use to resist compression. Wrought iron in short columns is not more than half as strong; in long columns, a new element, that of resistance to flexure, enters, which gives it an advantage. Granite is only $\frac{1}{4}$ as strong; Italian marble $\frac{1}{2}$; freestone $\frac{1}{10}$; and brick work still less. The following table presents the strength of a few different qualities of British cast iron, as found by the experiments of Messrs. Hodgkinson and Fairbairn made at the request of the British association:

Description of metal.	Compressive force per sq. inch in lbs.	Tensile force per sq. inch in lbs.
Devon iron, No. 3, hot blast.....	145,435	21,907
Buffery " No. 1, hot blast.....	86,397	13,434
" cold blast.....	93,385	17,466
Coed Talon iron, No. 2, hot blast.....	82,784	16,676
" cold blast.....	81,770	18,585
Carron iron, No. 2, hot blast.....	108,540	13,505
" cold blast.....	106,375	16,683
" No. 3, hot blast.....	133,440	17,775
" cold blast.....	115,442	14,200

The original tables are very complete of their kind, including results of trials of iron from nearly all the British iron works. As regards the effect of the hot blast, some soft irons of No. 1 appeared to be injured by it, and some of No. 2 also in a less degree; but the harder qualities were apparently improved. By successive meltings cast iron acquired an increase of strength and of elasticity, the maximum in these respects being attained at about the 12th melting. A report was published in 1856 by the ordnance department of the United States, which presented results of numerous experiments made by its officers upon the strength of different metals used for cannon. This report is referred to, and some of the results are noticed, in the article *CANNON*. Cast iron from a great number of works in the United States

was tested to prove its transverse and tensile strength, and the practice was continued by Major Wade from the year 1850. In consequence of the attention he caused to be directed to methods of improving the qualities of cast iron used for cannon, those cast subsequently to 1851 possessed nearly twice the average strength of those cast previous to 1841. For determining the tensile strength, 3 solid cylindrical pieces are cast and then turned to fit the hangers of the machine, the smallest diameter, equal in area to about one square inch, coming midway of their length, or about $1\frac{1}{2}$ inches from each end. The ends being securely clamped in the hangers, the weight is applied to draw the piece apart. The diameter of the fracture is accurately measured, and from this and the weight employed the data are afforded for calculating the weight required to break a bar exactly one inch square. Numerous samples of anthracite iron thus tested in 1850 and 1851 gave an average tensile strength of 17,200 lbs., some specimens bearing 20,000 lbs., and some only 13,000 lbs. Better results were obtained in succeeding years. "Lewistown hot blast anthracite," of Aug. 1853, gave for 4 trials a strength of 18,000 lbs.; "Marietta" iron of Jan. 1854, 23,500 lbs. In 1855 "Moselem," Berks co., Penn., and "Rough and Ready" iron, averaged about 21,000 lbs. In 1857 "Moselem" made in January, and mixed with "white Waywayanda," averaged 24,300 lbs. for 9 trials. What was called "gray cold blast anthracite Moselem" of April, 1857, mixed with $\frac{1}{6}$ of "white William Penn.," gave a mean strength of 32,000 lbs. The localities of the works, or rather the kinds of ore employed, appeared to have greater influence upon the strength of the iron than the fuel or temperature of the blast. In some instances cold blast charcoal iron broke with only 13,000 lbs. That produced at Crown Point, N. Y., from magnetic ores, averaged 18,300 lbs. A sample of "Greenwood" iron, Orange co., N. Y., brought by several remeltings to the maximum of strength, gave the highest result ever obtained with cast iron, breaking at last with 45,970 lbs. to the square inch. The tests cannot fairly be regarded as exhibiting the exact comparative values of the irons, because as received from the makers they are not of uniform temper. To give proper results for comparison, they should be mixed to present a "mottle" temper. No trials of transverse strength were made after 1852. The pieces subjected to this test were 2-inch square bars 23 inches long, brought to bear against 2 fixed knife edges 20 inches apart, and pressed half way between these by another knife edge in a movable stirrup. The results were very variable, but averaged more than $\frac{1}{2}$ the tensile strength; none went so high as 9,000 lbs. to the square inch, and none so low for sound bars as 5,000 lbs. Tests were also made of wrought iron of great strength. The tensile force of a sample of "Duncannon red short" was 73,000 lbs. to the square inch; and of cold short from

the same locality, 70,500 lbs.; a sample from Lake Superior, 52,500 lbs.—The alloys of iron with the metals, though numerous, are of little importance. With oxygen iron forms several definite compounds. The protoxide, FeO , is better known in combination than isolated; it is a powerful base, its salts of a bluish green, rarely colorless; obtained by the action of hydrogen upon either the carbonate or sesquioxide heated to low redness, it appears of a grass green color, but it immediately absorbs oxygen on exposure to the air, and becomes the sesquioxide; combined with carbonic acid, it forms the ores called carbonates. The sesquioxide or peroxide, Fe_2O_3 , is a natural product forming the ore known as red hematite or specular iron, and combined with water the hydrated peroxide, brown hematite; it presents different shades of bright and violet red, is the coloring material colcothar or rouge, and alone or in combination with water, and more or less mixed with clay, it forms the red, yellow, and brown ochres; the magnet does not affect it, and it is infusible; by calcination it is rendered very difficult of solution in acids; it is of analogous character to alumina, and the two replace each other in combinations. The salts of the peroxide are brown or yellow; they are easily decomposed by many chemical reagents; in dyeing and calico printing they serve the purpose of mordants, and in medicine are used as tonics and astringents; the protoxide and its salts have this application also. Peroxide of iron is found in the ashes of blood, and in those of the plants on which red-blooded animals feed. Ferric acid, FeO_3 , is an unstable compound formed by igniting the peroxide with nitrate of potash; the oxide takes up more oxygen, and the acid formed combines with the potash; the salt thus produced dissolves freely in water, coloring it a deep purple; if potash be in large excess, the salt may be obtained in dark crystalline grains, but it tends to decompose and reproduce the peroxide. Magnetic oxide of iron, Fe_3O_4 , called also black oxide and ferrosferrie oxide, is a natural compound of the two oxides, and is expressed by the formula $\text{FeO}, \text{Fe}_2\text{O}_3$; this is usually understood to be the composition of the natural loadstone or magnetic iron ore; it is also described as formed of this compound and of another expressed by the formula $2\text{FeO}, \text{Fe}_2\text{O}_3$; it is a black opaque substance, giving a black powder, and may be artificially made by passing steam over iron wire heated to redness; the oxide forms in brilliant crystals upon the wire, which by the microscope are seen to be octahedrons like those found in this natural ore.—IRON ORES. Iron as an oxide is rarely absent from any of the rocks, and in almost every mineral it is found as a trace or coloring ingredient, if in no greater proportion; but only those minerals are classed as ores which contain 25 or 30 per cent. of the metal, this being the least quantity it is found profitable to extract. Some compounds, moreover, which contain a still larger proportion of the metal than this, as iron pyrites, are not treated as ores, owing to

the difficulties of thoroughly reducing them. Native iron is described as occurring in various localities in small quantities, as in the form of thin laminae in an ironstone conglomerate in Brazil, in lava in Auvergne, in a piece of 4 lbs. weight in the mine of Hackenburg, described by Cramer, and in other places also, one of which is Canaan, Conn.; but Dr. A. A. Hayes reports that the specimen from this locality, from its composition, must be of artificial production. Dr. F. A. Genth has recently announced ("American Journal of Science," Sept. 1859) the reception of specimens which appear to be "real native iron" from the vicinity of Knoxville, Tenn., and northern Alabama, which yielded to analysis as follows: iron 99.790, nickel with a trace of cobalt 0.140, magnesium 0.022, calcium 0.121, silicon 0.075=100.148. Native iron is also the chief constituent of meteorites. Wherever met with, it has, however, proved of no importance for practical purposes, except it be near Liberia in western Africa, where, by reports of missionaries made in 1851 and 1853, it appears that it has long been worked by the natives into their rude agricultural and warlike instruments. A specimen of the iron supposed to be native analyzed by Dr. Hayes was found to consist of 98.4 per cent. of pure iron, and 1.6 per cent. of quartz grains, iron crystals, magnetic oxide, and zeolites. The presence of the last named, and the absence of carbon, which he states is always contained in manufactured iron, and more than all in that made by the rude processes of semi-civilized people, are regarded as positive evidence that the iron cannot have been of artificial formation. The accounts received of its mode of occurrence are too vague to throw any further light upon its real character. Mr. Lesley supposes that it is meteoric iron, similar to that discovered in 1852 near Thorn in Prussia, spread over an area of some 700 acres just beneath the soil, and estimated to amount to not less than 1,000 tons. This is regarded by Karsten as meteoric, though it contains no other metal combined with the iron; but Rose, the Berlin chemist, is understood to discredit its meteoric origin. Its mixture with an olivine mineral indicates that it cannot have been artificially produced. That the natives can reduce the ores is evident from the account of Dr. Livingstone, who in writing from the country of the Manganya in May, 1859, speaks of the natives being all provided with knives of their own manufacture, and says that almost every village has a furnace for reducing the black magnetic iron ore.—The important ores of iron are the magnetic, specular, brown hematites, red oxides of the older secondary, the carbonates, and the bog ores. The hematites and bog ores are described under their own names in this work. The magnetic and specular accompany each other in the same formations, and will be described together.—The magnetic ores consist of the magnetic oxide of iron, often crystallized and in crystalline masses of great purity. It is also intermixed

with various minerals, chiefly quartz, feldspar, hornblende, phosphate of lime, and sahlite; and is associated with oxides of titanium, zinc, manganese, and chrome. When highly magnetic and exhibiting polarity, as is frequently the case, it is called loadstone. Its crystals are octahedral. Its hardness is 5.5 to 6.5; specific gravity 4.9 to 5.2; color iron black, and when powdered the same. It is the richest ore of iron, and no known chemical compound of this metal with any other element can produce a higher percentage of iron than the crystals of this ore; and their yield cannot exceed 72.4 per cent., according to the formula of their composition, FeO , Fe_2O_3 ; and the pure specular ores cannot yield over 70 per cent. of iron. Some qualities of it produce excellent pig iron both for foundry and forge purposes; but it works better mixed with leaner ores. Rich hematites that are deficient in silica are smelted to much better advantage by mixture with $\frac{1}{4}$ their weight of magnetic ores with silicious gangues than alone. The quartz intimately mixed with the oxide of iron presents at every point its silica to form with the other earthy matters the fluid glassy cinder required to set the iron free. The magnetic ores (as described in the article BLOOMARY) supply the forges in which malleable iron is produced direct, and it is generally this class of ores which have yielded their metal to the rude processes of the ancients and of half civilized nations of the present time. Those varieties are considered to work most easily in these processes, and to make the most ductile iron, which are the most coarsely crystallized and readily crumble down into clean coarse particles.—Specular iron is distinguished by its red powder; the ore itself is red when earthy, but when compact it is of a steel gray, or iron black, with metallic and often brilliant lustre. It crystallizes in rhombohedral forms, the faces often irised and shining like a mirror; whence the name, from the Latin *speculum*. The hardness of the mineral is 5.5 to 6.5; specific gravity 4.2 to 5.3. It consists of iron 70 and oxygen 30 per cent. Some varieties which do not possess a metallic lustre should properly be classed with the specular ore, though known by other names, as the red hematite, anhydrous red ochre, reddle or red chalk, &c. Micaceous specular iron is a variety of micaceous structure occurring in sheets like mica slate, with bright shining lustre. This beautiful and rather unusual form of the ore is found in Hawley, Mass.; in Piermont, N. H.; Phillipsburg, N. J.; Stafford co., Va.; and York district, S. C. The red hematite variety is found on the Aroostook river in Maine, and also at Woodstock, N. B., near the boundary line of Maine. Specular and magnetic ores together form rocky ledges of which extensive hills and ridges are in chief part composed. Such masses are not rare in regions of granitic and metamorphic rocks. They are met with in Sweden, Norway, Lapland, and Siberia, and it is the ores from these countries, and especially from the famous mines

of Arendal and Danemora, which have long supplied in their celebrated brands the strongest bar iron of commerce, and the essential element for the superior cast steel of the English manufacture. The ores also occur in other forms, as in beds of several hundred feet thickness and extending several miles in length, and also included in elongated lenticular masses between the slates, which are of micaceous, talcose, and chloritic character, with the same associates of quartz rock and magnesian limestone that belong to them on this side the Atlantic. In Siberia the great ferruginous masses are associated with greenstones and porphyries, all alike occurring in dikes of eruptive character. In the United States these ores are found under the same conditions and equally abundant as in the most favored foreign localities. Beds over 30 feet thick, not, however, conveniently situated for working, traverse the high granitic hill called the Baldface mountain in Bartlett, N. H.; at Piermont also the specular ore is found in one of its large developments. In Vermont these ores are distributed among the metamorphic slates of the Green mountains, and are worked in many localities chiefly to mix with the hematites in the blast furnace. On the W. side of Lake Champlain, in the gneiss, feldspathic, and quartzose rocks, they form great numbers of valuable beds, the ores often of remarkable purity and chiefly magnetic. Throughout Essex and Clinton counties, N. Y., they supply the blooming establishments and blast furnaces of this great iron district, bloomeries being almost exclusively employed in the northern portion, upon the Ausable river, and blast furnaces being more in use in the southern part of Essex co. near the lake. In the Adirondac region the magnetic ores form very extensive beds, and the ores assume a titaniferous character. In Franklin co. the ores are associated with hornblende rocks and traversed by trap dikes. In St. Lawrence co. magnetic ores are scarcely found, but the peroxide of great purity is abundant in very large beds at the junction of the granitic rocks and the Potsdam sandstone, and sometimes resting upon serpentine. The quality of the ore is variable; in some of the beds it is slaty and micaceous; in some stony and specular; and again it is met with of an earthy character, coloring the surface of the ground wherever it is carried a deep red. The ores are used only in the blast furnace; in this they work easily, making iron fast, but of a quality inferior to that produced by the magnetic ores and hematites; it is used chiefly for castings. In the highlands on both sides the Hudson river, in Putnam, Westchester, and Orange cos., magnetic ores are found in extensive beds. They were worked in the last century in numerous forges, hard-wood charcoal being cheaply obtained for their reduction, and water power being everywhere conveniently near the mines. At present they supply in part a few blast furnaces, but are worked very far below their capacity of production. Near the New Jersey

line the bodies of ore are also very considerable. Along the range of metamorphic rocks through northern New Jersey valuable mines have long been worked for bloomeries and smelting furnaces. Some consist almost wholly of specular iron; but magnetic ores prevail. The variety called Franklinite, an account of which is given under that name, is found in this district, and has of late been proved to be an ore of considerable importance. The range crosses the Delaware at Easton, Penn. Mines have been worked in Lehigh co., Penn., and an enormous body of the ore associated with copper ores is found in Cornwall, Lebanon co., at the junction of the new red sandstone formation with the altered lower silurian slates, and held as in a cup between dikes of trap which dip toward each other. As the magnetic ore range crosses the southern line of the state just east of the Susquehanna river, the ore is found in serpentine, and is so associated with chrome that it has been extensively mined for this product. Several localities on both sides the state line furnish also magnetic ores highly charged with titanium. Some obtained from a chloritic and talcose rock have long supplied iron works in the northern part of Hartford co., Md. In Montgomery co., near the Potomac, the magnetic and specular ores occur associated with pyritous copper and mundic, or iron pyrites, and with steatite, the rock containing the beds being a hard ferruginous quartz. Through Virginia the magnetic ores are of little importance. In North Carolina they are again found very productive, ranging across the state in 3 belts, the ore sometimes changed to specular. The most eastern belt, passing through Chatham co., is of least importance; the other two traverse the gold region, and are contained between Guilford, Randolph, and Montgomery cos. on the E., and Surrey, Davie, Cahawba, and Lincoln cos. on the W. Many of the mines, particularly in Lincoln co., have been very productive, and the ores have been worked for bloomeries and furnaces. In South Carolina the associated magnetic and specular ores are chiefly confined to a narrow belt of slate in York, Union, and Spartanburg districts; they are in sufficient abundance to give support to a number of furnaces. Through northern Georgia the ferruginous belt traverses Lumpkin, Cherokee, and Cass cos., and is most extensively developed in the Allatoona hills, N. of the Etowah river, the ores being in part magnetic, but chiefly hematite and specular. They are converted into iron at furnaces on the Etowah. West of the Appalachian belt of metamorphic rocks no localities of magnetic iron ore occur till the great outspread of the fossiliferous rocks of the interior states is passed, and the azoic rocks are again found occupying the surface in the states of Missouri and Wisconsin, and in the northern peninsula of Michigan. The great beds in Missouri (see IRON MOUNTAIN) are chiefly specular, but magnetic ore is found associated with it in several localities. In northern Wisconsin beds of the two oxides of great extent

are occasionally met with in metamorphic slates and gneiss rocks, from the vicinity of the Mississippi river, on Black river to Montreal river, the N. E. boundary of the state. Far E. of these localities, in the district lying N. of the Menomonee, between Green bay and Lake Superior, are some of the most extensive beds of magnetic and specular ores, chiefly the latter, found in any country. They appear near ridges of trap in a belt of crystalline slates which extends W. from Lake Superior. The belt is from 6 to 10 m. wide, and is bounded N. and S. by a granitic district. The principal development of the ores is first met with 12 m. back from the lake, and localities of them are of frequent occurrence extending 18 m. further W. Along the southern margin of the slate district another group of beds tend to range themselves in the same direction; and about 30 m. back from the lake, where the slate district extends S. into Wisconsin, the same developments of ore accompany it to the Menomonee river and toward Green bay. The mines are reached by a railroad from the lake shore 12 m. long, and the ore is obtained by open quarrying. It forms ridges, one of which is from a few feet to 50 feet in height and 1,000 feet wide, and extends almost continuously for 5 or 6 m. In this the ore is of variable quality, as it is more or less intermixed with jasper, hornblende, and feldspar; much of it is remarkably pure, yielding 68 per cent. of iron, with not a trace of manganese, phosphorus, or sulphur. Another ridge 50 feet high presents precipitous walls of almost chemically pure ore, a portion being fine-grained specular ore of imperfect slaty structure, having minute crystals of magnetic oxide disseminated through it; and some consisting wholly of the minute crystals of magnetic oxide. Large bodies of this must contain 69 or 70 per cent. of iron. At another point a hill rising 180 feet high consists of alternate bands of pure, fine-grained, steel gray peroxide of iron, and deep red jaspery ore; the layers are generally less than $\frac{1}{2}$ inch thick, and are curiously contorted. They present a beautiful appearance as exposed in the almost vertical walls. This deposit is estimated to be 1,000 feet wide and more than a mile long. Near Lake Superior extensive works are in operation, converting these ores into blooms, which are shipped together with large quantities of ore to be smelted in the furnaces near Detroit, and in Ohio and western Pennsylvania. There are also three blast furnaces making pig iron, one establishment of two furnaces at Negaunee near the Jackson mine, and the Meigs furnace at Dead river, the capacity of which is about 10 tons per day for each furnace. The business is rapidly becoming of immense importance, as may be seen from the transportation of ore and iron to the lake, for shipment by the Bay de Noquet and Marquette railroad, which up to Oct. 8, 1858, amounted in that year to 28,913 tons, and to the same date in 1859 to 75,875 tons. It is stated that from 10 to 20 vessels have been constantly waiting during the season

of navigation for cargoes; and the demands for the year 1860 will require a supply of 150,000 to 200,000 tons. The current price of this ore, yielding from 65 to 70 per cent. of pig metal, has been \$3 per ton of 2,240 lbs. delivered on board. Canada abounds in magnetic and specular ores. The formation which contains them connects with the iron-bearing rocks of northern New York, and extends N. E. toward Labrador. Many of the beds are of immense size, and the ores are often very pure; they are however but little worked.—The previous condition in which the magnetic and specular ores may have existed is involved in much obscurity, and different theories are entertained respecting it. Generally occurring in rocks supposed to have derived their characteristics from igneous action, the ores are believed by many to have been brought into their present condition and position by the powerful agency of heat derived from interior sources. The columnar structure often noticed in the magnetic ores is appealed to as evidence of their having been melted, and also the occurrence of the earthy minerals along the upper surface of each bed when this lies in an inclined position, the oxide of iron by its greater gravity seeking the lowest plane. Prof. H. D. Rogers states that he has noticed this arrangement in the veins of this ore throughout the highlands S. W. to the Schuylkill, and in the magnetic ore district W. of Lake Champlain. In Siberia the ores, associated with igneous greenstones and porphyries, are described as exhibiting the same evidences of fusion as these exhibit, and of having flowed like beds of lava into depressions and crevices. On the island of Elba the masses of ore have the appearance of eruptive dikes of basalt, and the effects upon the sedimentary rocks in contact are similar to those observed when trap dikes traverse them. They there penetrate strata near the period of the jurassic, and by eruptions supposed to be as late as the epoch of the chalk. (Burat, *Géologie appliquée*.) The masses of porphyry and of the other wall rocks included in the magnetic ores aid to support the view that these have been melted and forcibly ejected from below into the rents that were formed across the strata and the fissures that opened between them. Some veins also are supposed to have been filled by metallic sublimations, as when their walls are seen incrustated with successive layers of different qualities, which display sometimes a curious symmetry in their arrangement upon the two opposite walls. In this way the inner walls of blast furnaces during a long blast collect metallic incrustations which have the appearance of natural ores. (See CADMIA.) Another theory is that the metallic contents of the veins have been segregated from the wall rocks through the influence of electric currents; and another that the fissures and cracks, whatever their direction in relation to the stratification, were filled from solutions of their contents, as crevices in rocks are now lined with incrustations deposited by mineral waters, hot springs,

and geysers. It is also contended that the deposition of the ores was sedimentary and contemporaneous with that of the formations which contain them; that these were also of sedimentary origin, and the same causes that afterward rendered them metamorphic operated with other independent chemical agencies to change the character of the ores. The bodies of peroxide of iron of St. Lawrence co. are generally admitted to have been sedimentary deposits brought together in the depressions of the gneiss and ancient azoic rocks, as the bog ores are collected at the present day. It is difficult to conceive of the vein-like masses of magnetic ore with all its crystalline associates having this origin; but the intimate union commonly observed between the two ores cautions us against ascribing to them incompatible modes of production. As the sandstones and shales of the secondary rocks may produce the quartz rocks and metamorphic schists, the interstratified beds of iron ores may perhaps be converted into the beds of magnetic ore, and appear in the altered rocks like the veins or beds that run and dip with the strata. From the different modes in which the ores are found, it is reasonable to suppose that they have been brought together under different influences, and that each one of the several theories may have its own local applications. The subject, which opens one of the most extended and complicated fields of chemical and geological research, may be studied in Burat's treatise already referred to, and in his *Traité de géologie*; also in the works of the following authors, who oppose the old theory, still maintained by the English geologists, of the igneous origin of veins: Bischof (*Geologie*), Fournet (*Simplification de l'étude d'une certaine classe de filons*), Cotta, Breithaupt, and others. See also Lesley's "Iron Manufacturer's Guide," Lieber's and Tnomey's reports on the geology of South Carolina, and the geological reports of other states.—The red oxides of the secondary rocks (without reference to some deposits of hematite produced along the outcrop of beds of carbonate of iron of the devonian and carboniferous groups) constitute a very important source of the iron produced in the United States. They occur in bands of no great thickness, in the series of upper silurian strata, known as the Clinton group of the New York survey, a formation of variegated calcareous shales, argillaceous limestones, and calcareous sandstones, its lower portion of greenish and yellowish slates. With the limestones and sandstones are frequently interstratified one or two bands of fossiliferous ore; and among the slates occurs a heavy, red, ferruginous sandstone, of which a few thin layers usually contain enough peroxide of iron to render them workable iron ores. The limestones abound in marine fossils, as corals, shells, and crustacea, and the ore is often filled with similar evidences of deposition from the waters of an ocean. The group attains its greatest thickness in the central parts of the Appalachian

chain in Pennsylvania, and by the repeated folding of the strata between Harrisburg and Williamsport it is many times brought to the surface, as it ranges with the mountains across the state. Its great development at Montour's ridge will be noticed after tracing the extent of the outcrop of the formation. It appears near Cumberland, Md., where it has been worked in the olive slates in a thin layer 10 to 15 inches thick, stretching along the valley of Wills creek, a tributary of the Potomac. Through Virginia it is unimportant, but in eastern Tennessee, under the name of the Dyestone ore, it maintains a large number of blast furnaces, and is also worked in bloomary fires. It is found in Cherokee co., Ala., where the formation seems to expire. Through the N. W. edge of New Jersey the formation ranges parallel with and near the Delaware, but is thin and unproductive; so it continues to the Hudson at Rondout, thence N. into Albany co., and N. W. along the hills S. of the Mohawk valley. In Oneida co. to the S. of Utica the formation, spread out in horizontal sheets, is again productive in ore, and supplies furnaces here and around Oneida lake, which it encircles. Its ores are also transported into the anthracite region of Pennsylvania to be smelted in the great furnaces at Scranton, and the canal boats that carry the ore bring back anthracite for the furnaces near the mines. Vanuxem, in the state geological report, p. 262, describes the ranges of ore as more extensive, of better quality, and as less covered up with superincumbent layers, than he had seen them in Pennsylvania. There are commonly found two layers of ore, of thickness varying from one to two feet, and separated by about 20 feet of shales. The lower is usually of oolitic structure with few fossils; the upper is also oolitic, and made up of larger concretions, which prove on examination to be fragments of corals and encrinites coated with peroxide of iron and their calcareous substance in the case of the corals replaced by it, but with the encrinites the replacement is of carbonate of iron. This was observed by Vanuxem in the town of Clinton, where the upper ore, with intermixed calcareous rock, attained a thickness of 4 feet. Beneath it were 17 feet of sandstones, shale, &c., and under these ore again of poorer quality resting on layers of sandstone and shale. These were only 5 feet thick, and under them was a third layer of ore 10 inches thick, hard and silicious, and succeeded by greenish shales and thin-bedded sandstones. Beyond Oneida lake the formation maintains its productive character, supplying several blast furnaces along a narrow belt of country parallel with the S. shore of Lake Ontario and not far distant from it. The southern margin of the belt is defined by the calcareous strata of the Niagara group, beneath which those of the Clinton group pass by a gentle southerly dip. The ferruginous belt crosses the Niagara river at Lewiston; it thence extends through Canada West to the Manitoulin islands; it then strikes across by Mackinaw and the N.

shore of Lake Michigan to Green bay, and extends S. up the W. coast of the lake, and disappears in eastern Wisconsin. About 40 m. W. of Milwaukee, in Dodge co., the ore attains the extraordinary thickness of 25 to 30 feet; it is in the form of sand or seed, forming a ridge which is traced nearly a mile in length. In the town of Hubbard it is estimated that there are 27,000,000 tons of ore in a layer 10 feet thick spreading over 500 acres. The ore is not fossiliferous, as in the eastern states, but highly oolitic and silicious. It contains about 50 per cent. of iron, and makes cold short metal. The bed is underlaid by shale and limestone, and overlaid by a coarse, cavernous, magnesian limestone. The same formation is found near Zanesville, Muskingum co., Ohio, and in Bath co., E. Tenn.; in the latter place it had been worked in a blast furnace 47 years preceding 1838. These western localities present the outcrops in that direction of the same geological group which in the eastern states sinks beneath the later formed series of rock which now occupy the surface of the broad intervening country, beneath all which there can be no question the group continues; neither, as the succession and order of the strata are studied, can a doubt be entertained that all this area was covered by an ancient silurian ocean, from the waters of which the ferruginous sediments were deposited among the corals and shells that covered its floor;

where the depth of water was too great for these organic productions to thrive, the sediments were gathered upon a lifeless floor, and no fossils are now met with in their solidified materials.—The most important locality of this ore is Montour's ridge, Penn., passing by Bloomsburg and Danville. It is here presented in a most convenient position for mining, and at a point where anthracite for smelting can be delivered by canal at the lowest rates. Equal facilities for manufacturing iron upon a large scale, combined with easy access to the great markets of the country, are nowhere else found, and they have been largely improved. In 1857, 14 anthracite furnaces ran on this ore wholly, and 8 more used it with magnetic and hematite ores. Pig iron was produced upon a large scale at Danville at the extraordinarily low cost of \$11 per ton, and in the great rolling mill connected with the furnaces was converted into railroad iron. The ore being calcareous contained its own flux in part, and rapidly underwent reduction. The malleable iron obtained by puddling was liable to be cold short, a defect sometimes remedied by the introduction of a portion of red short ores into the charge. The percentage of metal obtained varied with the qualities of the ores used, of which at least three are recognized. The composition of these is thus given by Prof. Rogers ("Geology of Pennsylvania," vol. ii. p. 731):

Description of ore.	Peroxide of iron.	Alumina.	Silica and insoluble matter.	Water.	Carbonate of lime.	Loss.	Malleable iron in 100 parts.
Danville iron sandstone, brick red, somewhat fossiliferous, grain and aspect of a red sandstone, called the "hard ore".	70.63	0.57	23.77	2.57	2.46	...	48.97
Danville calcareous fossiliferous ore, dark purplish brown, slaty, micaceous	30.34	{ ox. mang. trace }	2.64	1.80	{ 62.43 + car. mang. 2.75 }	...	21.08
Bloomsburg compact, calcareous, fossiliferous ore, of similar color and structure with the last	61.30	trace	2.80	2.20	33.17	0.53	43.00
Bloomsburg soft, porous, fossiliferous ore, dark reddish brown, gives red powder, full of pits and casts of fossils.	55.10	5.00	7.10	2.10	trace	0.40	60.00

The soft porous ore, which is the most highly esteemed, was used in the furnaces in the proportion of about $\frac{1}{3}$ of the charge; and this is about the proportion which Prof. Rogers estimated in 1846 that it bore to the other ores. He considered it the product of the outcropping edges of the compact calcareous ore, enriched by removal of its carbonate of lime through atmospheric agencies, and consequently limited to the depth which these agencies might have reached. The strata that contain the several layers are found along each side of Montour's ridge, extending full 8 miles in length, and pitching down its sides at a much steeper angle than the slopes of the surface; sometimes the slope of the former is 30° where that of the latter is only 15°. The ridge is itself an anticlinal axis, its central portion formed of the hard white sandstone of the next lower formation. The following is the general character and plan of arrangement of these strata, commencing with the highest, as exposed on each side of the ridge:

	Thickness.
Red shale with a few green, no fossils	320 feet.
Red and green shales alternately	60 "
Upper calcareous shales, sandy, fissile, often highly fossiliferous, with fossil limestones 1 to 12 inches thick; fossils, <i>beyrichia</i> , <i>atrypa</i> , <i>avicula</i> , <i>strophomena</i> , <i>euomphalus</i> , <i>enerini</i> , favosites, &c.	160 "
Ore sandstone, calcareous, tough, with thin shales.	8 "
Lower calcareous shales, greenish and olive colored, fissile, imbedding thin limestone plates, all fossiliferous, and with the fossil ore band 14 to 20 inches thick, 25 feet from the bottom	60 "
Upper slate, green, fissile, with thin clay sandstones; only fossil, the marine plant <i>buthotrephix gracilis</i> .	50 "
IRON SANDSTONE with its HARD ORE, 1 foot 4 inches thick	53 "
Lower slate, green, weathering yellow, sandy, compact, or fissile, ore band in the middle, and the Clinton fossil <i>buthotrephix gracilis</i> throughout.	700 "
White sandstone of the New York Medina group.	

The lower slates climb highest up the slopes of the white sandstone core of the mountain, and are seen indeed arching over the summit of the ridge for miles in length; they therefore present the greatest available quantities of the ores they carry. These form several layers of the inferior silicious quality, known as "hard ore," sometimes properly a ferruginous sandstone. The "iron sandstone" next above these

slates furnishes a similar ore in 2 or 3 layers. The fossil ore bands are really calcareous beds, varying in number, thickness, and percentage of iron, the proportion of this increasing with the quantity of carbonate of lime removed. Prof. Rogers estimates that from 30 to 40 yards down its slope from the outcrop it will not be profitable to mine on account of its calcareous character; and that to the depth of 35 yards the main bed, averaging 16 to 18 inches in thickness, must produce, where not broken in upon by ravines and depressions in the hillside, about a ton of ore to the square yard, or 61,600 tons on each mile of outcrop. By a careful computation the following are presented as the quantities of the several kinds of ore that are available on both sides of the ridge for a distance of 8 miles: soft fossiliferous ore, 1,210,000 tons; compact calcareous fossiliferous ore, 710,000 tons; silicious ore of the iron sandstone, 1,400,000 tons; silicious ore of the lower slates, 1,752,000 tons; total, 3,672,000 tons. This, at the rate the ores have been consumed for the last 15 years, would be a supply for only about 20 years, so that this enormous quantity should be ere long exhausted. Larger supplies of the silicious ore may be reached by following the beds to great depths; but when the soft ore required to work it advantageously is exhausted, the harder kind will lose its importance.—The carbonate of iron is found in several varieties and in many geographical formations, from the azoic to the tertiary. It occurs in the forms of spathic iron or brown spar in veins in the metamorphic rocks, such as are worked for other metals; and on the European continent it is so abundant that it is extensively mined for its own sake. The iron it produces is well adapted for steel, and is the source of much of that known as German steel. It is this ore that produced in the Styrian works the Norican iron so famous in ancient times. It is hardly known as a source of iron in the United States. A vein of some extent is found at Roxbury, Conn., in gneiss; but the ore is associated with sulphur, and for this or other reasons it has never been successfully worked for iron.—Spathic iron is white or pearly, but becomes yellowish and brown by exposure. It crystallizes in rhombohedral forms; its hardness is 3.5 to 4.5; specific gravity usually about 3.8. By being left to spontaneous decomposition in the open air, the ore is converted into a mixture of peroxide and hydrated peroxide without change of form, and is very much improved in its qualities and yield as an ore of iron. Pure spathic iron is a carbonate of the protoxide of iron, and should consist of carbonic acid 38.53, metallic iron 47.47, and oxygen 14 per cent. It always occurs, however, more or less mixed with carbonates of manganese, magnesia, and sometimes lime.—The stony carbonate, called also sphero-siderite, because generally found in balls, is one of the most important ores of iron. It occurs chiefly in the shales and fire clay of the coal measures, but is also worked in the slates of the devonian

series, and in later formations to the tertiary. In England, where it is the sole dependence of nearly all the furnaces, it is a lean argillaceous and silicious ore, known as clay ironstone, and yielding from 30 to 33 per cent. of iron, seldom as much as 40 per cent. It is obtained in convenient proximity to the beds of coal, the same shaft frequently penetrating several strata, through which nodules and bands of ore are distributed, and with which beds of coal alternate. The ores are easy of reduction in the furnace, and generally, by the improved processes of manufacture, make a fair quality of iron, though this varies much with the method of working and the mixtures used. In the coal measures of the United States these ores cannot be depended upon for large supplies. In Pennsylvania they are silicious rather than argillaceous, producing, according to Prof. Rogers, in the anthracite measures an average of 28 per cent. of silica, and those of the bituminous coal fields 18 per cent., while the proportion of alumina is only 2.2 per cent. Carbonate of lime is usually present to the amount of from 1 to 6 or 8 per cent., and carbonate of magnesia and carbonate of manganese, each 2 or 3 per cent. The ore occurs in balls, nodules, and flat blocks or plates interspersed with more or less regularity among the slates and fire clays, in layers conforming to their stratification, and is worked either by stripping the whole stratum of slates from the surface and selecting the ore balls, or by drifting it horizontally as the coal beds are worked. No exact estimate can be made of any certain quantities that will be produced by drifting, and large furnaces in favorable localities are with difficulty furnished with their necessary stock. In eastern Ohio and western Pennsylvania it is even found on this account expedient to make use in part of the more certain supplies of specular and magnetic ores from the distant mines of Lakes Superior and Champlain, which moreover by the mixture improve the quality of the product. The ores that occur in flat blocks are more to be depended upon for continuance than the balls. Some of these, when found of a dark color, are frequently called black band ore, as if to identify them with the carbonate of the Scotch coal measures so named by Musliet, who brought it into notice. In Scotland this band of ore has proved a very valuable stratum owing to its abundance and cheapness, and easy reduction with little fuel, the last owing to the bituminous matter it contains in very variable quantity, which in some cases is reported to amount to 20 per cent. or more. In Tennessee and western Virginia an ore of the same character is found, and in the former state has led to the erection of several furnaces. In western Pennsylvania there is a highly valuable stratum of ore distributed throughout the lower coal measures, which is very productive over large areas, easily worked, and produces a large percentage of iron. It is known as the buhrstone ore, from a cellular flinty or cherty accompani-

ment which usually underlies it. This chert most abunds where the ore is deficient, and *vice versa*; both rest upon and in the depressions of a peculiar bed of fossiliferous limestone, which is traced over wide areas extending into several of the states. The ore is itself of cellular structure, the cavities lined with quartz crystals. In places it is beautifully variegated with the disks of encrinites crystallized white upon a blue and purple ground, and sometimes the ore is itself crystalline. On the outcrop it is a hydrated peroxide of iron, and within it is the protocarbonate commonly mixed with peroxide. It contains so much carbonate of lime, that it is frequently smelted without addition of flux; and it is also found so highly charged with this that it becomes a ferriferous limestone. The following analyses were given by the state geologist in the 4th annual report:

Locality.	Carb. iron.	Perox. iron.	Iron.	Iron.	Water.	Carb. mang.	Iron.
Armstrong co.	68.92	..	10.58	15.54	4	1.35	32.95
" "	54.83	..	40.90	trace	4	alumina trace	25.34
Bennett's B'ch	55.10	9.50	21.00	5.80	3	carb. mag. 5.40	34.72

The carbonate and hematized carbonate outcrops in and under the coal measures have been regarded as an important source of iron in Pennsylvania, and yet, according to Mr. Lesley ("Iron Manufacturer's Guide," p. 433), they will hardly bear comparison with those of the grander outspread of the same formations in Ohio, Kentucky, and western Virginia. But further west, in the coal measures of Illinois, Missouri, and Iowa, they entirely fail. It is these ores that have furnished in southern Ohio the supplies for the numerous furnaces about Hanging Rock and at other points, the iron from which has had a reputation almost equal to that made from the genuine hematites of the metamorphic rocks. They abound more around the margin of the great coal fields where the lower members come to the surface than in the middle portions. No particular relation is observed between their distribution and the coal beds, as they occur either above or below, close to or at a distance from the coal; and indeed, in the devonian slates, many hundred feet beneath any beds of coal. Still it may be, as argued by the Professors Rogers, that organic matter has furnished by its decay the carbonic acid of these ores, and converted an original deposit of peroxide of iron, disseminated through calcareous, silicious, and argillaceous sediments, into ferruginous protocarbonates; and the particles of these drawn together by the so called segregating force have united to form the concretionary lumps and plates in which the ore is now found. They occur in fossiliferous formations alone, and usually not in the red-colored slates through which peroxide of iron is still disseminated, but in those of gray color, or black with the bituminous matters with which they are permeated, and which retain but a trace of iron beside that belonging to the balls

of ore. These moreover are often formed around the fossil vestige of a fern plant or of a shell, which seems to have served as a centre to determine the commencement of the concretionary process. Limestones, as before observed, are seen to pass into the carbonate of iron, an effect resulting from the replacement of carbonate of lime by the former salt. A variety of the carbonate, found in white stony balls and masses in a stratum of clay that underlies the great conglomerate floor of the coal formation, is remarkable for the superior quality of pig metal it produces with charcoal for fuel. Some of the strongest castings ever made from any ores have been produced from this variety in Lycoming co., Penn. The malleable iron obtained by puddling is also remarkably strong. —Above the coal measures the only carbonates of importance, or iron ores of any kind excepting the bog ores, found in the United States, are those belonging to the tertiary clays about Baltimore, and along the western shores of Chesapeake bay. They resemble in character and in the manner of their occurrence the carbonates of the coal measures, but make a superior quality of iron, especially adapted for bars and nails. The ores are obtained by uncovering the clay beds, and are frequently in sufficient quantity to pay for stripping 15 or 20 feet of cover, and even for following the stratum out into the water, thus involving the expense of coffer dams. On the English South Downs, where beds of this character are found, the ferruginous masses are stated to be filled with fossil univalve and bivalve shells. Similar deposits occur between Calais and Boulogne, France, and in Belgium, the fossils of all which refer them to the crag formation of the older pliocene. The organic matter of the fossils may have induced in this formation the aggregation of the ferruginous particles.—In medicine, iron is employed in a great variety of combinations, and also in metallic filings and powder. It acts as a tonic, promoting the secretions and increasing the healthy action of the organs of digestion. The circulation of the blood is quickened and its color deepened. Its preparations are especially indicated in cases of debility resulting from inordinate discharges, and not attended with inflammatory symptoms. The most usual preparations are the tincture of chloride of iron, that of the acetate of iron, the citrate, and the iodide of iron.

IRON, a S. co. of Utah, bounded E. by the Rocky mountains, S. by New Mexico, and W. by California, extending therefore entirely across the territory; area estimated at 7,000 sq. m.; pop. in 1853, 847. It is crossed by several mountain ranges, and by Green and Grand rivers. In 1850 it produced 8,948 bushels of wheat, 663 of Indian corn, 2,530 of potatoes, 5,020 lbs. of butter, and 312 tons of hay. It contained one church. Capital, Cedar.

IRON MANUFACTURE. Only a general idea can be presented of this subject, the complete treatment of which requires a volume with

many illustrations. For the principle and method of reduction direct to metallic iron, the reader is referred to **BLOOMARY and FORGE. I. CAST IRON.** Ores are more commonly treated in blast or high furnaces, in which enormous quantities are rapidly decomposed as they fuse, the foreign substances forming a glassy cinder with the matters added as a flux, and allowing the heavy particles of iron, combined with carbon derived from the fuel, to collect at the bottom of the furnace. The operation is a delicate chemical process, dependent for its success on a nice adjustment of the materials employed; the exact proportions being determined empirically for such mixtures of materials. The processes of smelting vary somewhat with the nature of the ores and fuel employed, and also of the furnace in which the operation is conducted. This is a structure of pyramidal or cylindrical form without, built up of stone or brick, lined throughout with layers of the best fire brick, and strongly bound together with iron. It is essential that the foundation be perfectly dry, and thoroughly laid of stones without mortar upon solid ground. Those adapted for charcoal are from 25 to 40 feet high, and contain a circular cavity within, which gradually enlarges in diameter from the top of the stack or at the tunnel head, where it is 2 to 3 feet across, to a maximum of about $\frac{1}{4}$ the total height, which it attains about $\frac{2}{3}$ or $\frac{3}{4}$ the way down. The sides then draw in more or less rapidly—at a high angle for ores that smelt easily, and with a flatter slope for ores that require a longer time for their reduction. These slopes, supporting the great weight of the materials with which the furnace is charged, are called the boshes, and much importance is usually attached to the angle at which they are laid, which not only should vary according to the nature of the ores but also of the kind of fuel, and with the different quantities of air to be blown in, and even according to the kind of iron which the furnace is designed to make. Whatever in fact tends to hasten the operation requires steeper boshes; and whatever renders a slower process expedient demands flatter boshes. These may be drawn in till the area is reduced to an equal diameter with the opening at the top or even less, when the walls drop down either vertically or converging, and enclose the area called the hearth, or, as the French term it, the crucible, or working part of the furnace. This area in small furnaces is a foot or 2 feet square, and may be 3 to 6 feet high; in large stacks it is sometimes even 9 feet in diameter. In some furnaces constructed after the plan of those of Tuscany, which smelt with great rapidity the easily reduced ores of the island of Elba, the walls of the hearth are almost a continuation of the steep slopes of the boshes, and nearly the same form is now adopted for the large anthracite furnaces. The floor is made of a large block of the most refractory firestone or sandstone, a foot to 15 inches thick, and the walls are constructed of similar materials or of fire brick. An arch under the solid masonry of the stack on each

of its 4 sides affords access to these walls, and to the openings through them made for the introduction, usually on 3 sides, of the blast, and for the exit on the 4th side or front of the fluid materials. Through the walls of the hearth, $1\frac{1}{2}$ or 2 feet above the floor, the blast pipes pass into the interior, one or several in an arch, and each terminating in a double shell called the tuyère, through which water constantly circulates to keep it cool and prevent its melting. Around the tuyères the openings are commonly closed by masonry. Sometimes they are left open, and then afford an opportunity of watching the progress of the operation and seeing the condition of the furnace by the bright incandescent appearance of the materials as they drop down past the tuyères, shedding the melted iron in drops, or in case of bad working clinging to the walls and around the tuyères in black unreduced masses of cinder, obstructing the process and threatening to fill up the whole hearth and terminate the blast. In case of close tuyères an opening covered with a bit of glass or mica is left in the first bend or elbow of the blast pipe, through which the interior may be seen. On the side of the front or working arch of the furnace the wall of the hearth does not reach the floor, but the great block of stone, called the tympan stone, which forms the upper part of this wall, is supported at the two ends at least as high above the floor as the tuyère holes. Its front and under sides are protected by a heavy cast iron plate fitted to the stone. Under the tympan stone there is consequently an open passage into the hearth, and whatever melted material gathers there might flow out unless prevented by some obstruction; this is provided in what is called the dam stone, a block of triangular section laid across the front of the bottom stone of the hearth, its top rising close to the level of the bottom of the tympan, but 18 inches or 2 feet further out. An aperture, 4 inches wide in small furnaces, and 8 inches in large furnaces, is left through this stone for the flow of the melted iron; it is called the tap hole, and is closed with a plug made by mixing clay and sand, which is knocked out or perforated, when it is required to draw off the melted iron. The dam stone is protected on its outer surface by a cast iron plate 2 inches thick called the dam plate. By the obstruction thus provided the melted materials are retained in the hearth, the heavier portion seeking the lowest level, and the lighter cinder swimming upon the surface. As the hearth fills, the liquid cinder rises over the edge of the dam stone and flows like melted lava down a sloping bank in front, provided for this purpose, from which it is removed as it cools. For the hearth the most solid and refractory materials are selected, the stones often being quarried and cut a year before they are wanted, that they may be thoroughly seasoned. Fire bricks are also employed instead of stone. No portion of the stack is so subject to wear and to injury as the hearth, especially the portion of the walls immediately above the tuyères; and this being the first part to give

way, it is so contrived as to admit of entire replacement without disturbing other parts of the structure. If well made and the furnace is well managed, a hearth may stand uninterrupted use for 3 or 4 years, or even longer. It gradually enlarges by wearing away within, and at last the operations must be stopped that a new one may be put in. In front of the outlet for the cinder and iron is that part of the furnace establishment called the casting house, the floor of which is devoted to the moulding beds for the iron. As the liquid metal is caused to flow out it runs in a channel made in the sand from which side branches lead it off at right angles. The blocks of iron taken from the main channels are called sows, those from the smaller pigs. After each casting the beds are broken up and again prepared, each side of the floor being used alternately.—The arrangements for supplying air to the furnaces are necessarily of the most thorough and substantial character; they have already been noticed under BLOWING MACHINES. The quantity of air consumed has rapidly increased of late years, and with the use of taller stacks and denser fuel it has been blown under greatly augmented pressure. The more dense the air the greater is the amount of oxygen presented to the fuel in the same bulk, and more vivid combustion is excited by the mechanical effect of a powerful current. It produces a local intensity of heat, while increased quantity of air up to a certain limit promotes rapid combustion through greater areas. The importance of directing special attention to the blast may be perceived by considering that the weight of the air alone passed through a furnace exceeds that of all the solid materials, ore, fuel, and flux. The large anthracite stacks receive even 15 tons or more of air every hour. To force this constantly through the dense column of 60 feet of heavy materials involves the use of machines of great power; and the heaviest steam engines are consequently used for this purpose. In the large anthracite furnaces the pressure of the blast is sometimes 8 lbs. upon the square inch; in charcoal furnaces it is usually from 1 to 3 lbs. In summer, the air being more rarefied, a larger bulk is needed to furnish the same amount of oxygen; at this season it is less efficient for some other reason also, which may be the greater quantity of moisture it retains and carries with it into the furnace. To economize fuel and raise the temperature within the furnace to the highest degree, the air before being admitted into the furnace is made to pass through a series of iron pipes arranged in an oven, where a portion of the escaped gases circulate and undergo further combustion by mixing with atmospheric air admitted for the purpose. This oven in American furnaces is built upon the level of the top of the stack, and the blast pipe passes down from it to the tuyeres. The temperature of the blast is thus raised to such a degree that a jet will ignite a piece of wood or melt lead. By this improvement the consumption of fuel to the ton of iron has been greatly reduced, more iron is made in

the same time, and, in consequence of the higher degrees of heat obtained in the furnace, the same care is not required in the selection and preparation of the ores and fuel that is given to them for cold blast furnaces. Thus raw bituminous coal could be employed instead of coke, and anthracite could be applied successfully for the first time to the manufacture; more refractory ores could be reduced than before, and the necessity of roasting or calcining them before introducing them into the furnace was obviated. But the opportunity thus afforded of using inferior materials no doubt led to the production of inferior qualities of iron, and this gave a bad reputation to hot blast iron, which is not yet entirely removed, though at many works very excellent iron is made by the hot blast. The saving in fuel and time is unquestionably great; but this no doubt has been largely overrated in consequence of making the comparison with the operations of the inferior class of furnaces in use previous to the introduction of the hot blast. Some charcoal furnaces are still run with cold blast; but it is those only the product of which has had the highest reputation, and which still commands a price that compensates for the greater expense of the manufacture.—It was formerly considered essential to prepare the ores for the furnace by washing in open heaps or ovens, and then reducing them to sizes a few inches in diameter, screening them, and rejecting the dust and fine matters which would obstruct the blast. By the roasting, sulphur and other injurious volatile ingredients are in part expelled, and also water from the hydrates and carbonic acid from the carbonates; and the ores are thus purified, simplifying the process in the furnace, which consequently goes on with greater regularity, at the same time that the quality of the iron is improved. But in the large furnaces now employed the ores are charged in greater lumps, and the roasting is expected to be completed in the upper portions, while the more intense heat and powerful blast are depended upon to complete the fusion and reduction. The practice of mixing different kinds of ore is very generally adopted, both with advantage to the working of the furnace and the quality of the metal produced. Objectionable qualities in certain ores are thus modified by intermixture with others of opposite or different peculiarities. In their composition iron ores rarely contain such earthy matters as when separated from the iron will melt together to form a fluid glassy cinder. This, which is the first object sought for in reducing iron ores in the blast furnace, is attained by the addition of stony substances which are composed of the required ingredients. The best cinders, such as are produced only when the furnace is running well, are combinations of silica with alumina, lime, and other bases. Ores generally contain in their gangue the first two, and consequently require a calcareous flux. This is furnished by limestone, sometimes by oyster shells, the quantity depending on the character of the ore. Calcareous ores

require a silicious flux, as quartz or sand. The proportion of flux is generally from $\frac{1}{4}$ to $\frac{1}{2}$ the weight of the ores.—Furnaces require thorough drying by means of fires kept up within them for several weeks before they are fit to be put in blast. At last the ore with its proportion of flux is introduced in small quantities upon the fuel with which the furnace is nearly filled, and the proportion is gradually increased as more fuel is added. The blast is cautiously introduced, but it may be 2 or 3 days before the ore makes its appearance in the hearth, and then it is mostly imperfectly reduced and in the condition of black slags. Several days pass before the separation goes on with regularity, and if the mixtures are not skillfully made the most disastrous consequences may result from the furnace becoming obstructed and its contents chilled. This danger it is always liable to, and the only protection is in careful management and closely watching the running of the furnace. The charges are introduced at the top, to which they are hoisted by the steam engine or run in from a high bank against which the furnace is built, and are weighed or measured, that their proper proportions may always be secured. The fuel being introduced in its turn, the ore is thrown in so as to spread over the coal, and over the ore is scattered the flux; other layers are added in the same order as the charges sink down; and when it is found expedient to change the proportions in order to correct the running of the furnace or to obtain a different quality of iron, the charge of coal continues the same, while the burden, as it is called, or charge of ore and flux, is increased or diminished. The materials charged at the top may be 24 hours or more in making their way through the furnace. Their condition in the interior, and that of the process itself, is indicated by the appearance of the flames which issue from the top and from beneath the tump; by the manner of settling down of the charges, whether regularly or by sudden slips; by the appearance about the tuyères, whether bright or obscure and black; by the even or unsteady flow of the cinder, and its separation, thorough or incomplete, from oxide of iron, which when retained in large quantity makes it black and heavy, of sluggy appearance, and when very bad infusible and dry. In this condition it is drawn out with great labor over the dam, the workmen breaking it up from time to time with long iron bars or ringers thrust under the tump and stirred around in the bath of melted iron. Only in this way with ores of difficult reduction is the hearth kept clear of infusible slags and the furnace retained in working condition. Titaniferous ores especially refuse to make fluid cinders with any fluxes, or to allow all the oxide of iron they contain to be reduced to metal. With most ores occasional working in the hearth is necessary, which is the most laborious part of the process of smelting. While it is going on the blast is shut off, and when completed the front is covered over with loam, which is banked up so as to close the opening under the tump stone. When the

cinder again forms, and rises up to the top of the dam, a hole is made through the loam with an iron bar to give it an outlet. The hearth is tapped at the base of the dam for letting out the iron usually at regular intervals, twice or thrice every 24 hours according to the rate at which the iron is produced. As the operations go on from day to day the working of the furnace is constantly liable to irregularities from a multitude of causes, especially from the natural desire to crowd it too fast, increasing the burden of ore to the charge and adding to the blast. When, from this or any other cause, the working becomes deranged, it may be several days before the remedies applied, by lessening the burden of ore, altering the proportions of the flux or the quantity of air admitted, bring the process into proper train again, and the separation goes on regularly in the hearth. The iron master has a variety of checks in his control, and if possessed of experience and skill may repeatedly change the condition of the operation, and cause the furnace to discharge at his will the qualities of cast iron he requires. But, like any other machine, in unskilful hands it is soon thrown out of order, and the materials in the hearth once becoming chilled the blast is obstructed, the fire gradually deadens, and the mixed ores, flux, and fuel become fixed sometimes in solid masses to the walls of the furnace, destroying the hearth and the lining of the boshes and inner walls. When this danger is found to be imminent, the last resort is to rake out as rapidly as possible the great body of incandescent materials through the opening of the hearth, an operation that must be incessantly continued till completed, it may be for 24 or 36 hours, taxing to the utmost the powers of endurance of the men, who work in short relays enveloped in smoke and heated noxious gases, raking out and shovelling back the seemingly inexhaustible piles of glowing stones and coals. The cinders obtained from furnaces in good running order are of glassy structure, easily drawn out in long strings; they cool slowly, and are variously colored, often in bright blue and greenish hues from the oxides of titanium, manganese, and iron they may contain. They puff up in spongy masses when water is thrown upon them as they flow out, and give out the odor of sulphuretted hydrogen. Anthracite cinder is more stony in texture, usually of gray color, passing to black if the furnace is not working well. Many attempts have been made to apply the cinders to some useful purpose beside mending roads with them, for which they answer very well; but the expense of moulding and difficulties of annealing are too serious for the worth of any articles that could be made of them.—The production of cast iron is most advantageously conducted in establishments of great extent, comprising several first class furnaces. The mode of constructing furnaces is probably as perfect in the United States as in any part of the world. A short account of the pair of furnaces belonging

to the Thomas iron company on the Lehigh river, the blowing apparatus of which was partially described in the article already referred to, vol. iii. p. 381 of this work, will convey some idea of their great capacity. Two stacks of truncated pyramidal form are carried up 45 feet high upon a base of about 45 feet square; their distance apart is about 110 feet. A floor of masonry supported on arches extends from the top of one furnace to that of the other; upon it are placed the two sets of boilers, one heated from each furnace, and the two heating ovens for the blast. Under this floor are the rooms for the two steam engines and blowing apparatus. On the centre of each stack is a circular structure in fire brick about 28 feet in diameter, which carries up the furnace 15 feet higher, making the whole height to the charging plate 60 feet. In the masonry of this upper part is an annular flue in fire brick, measuring 6 feet in height and 4 in width, into which 8 flues lead from around the inner walls of the furnace. Their top is 9 feet below the charging plate, and the area of each one is 2 feet by 20 inches. Two partitions across the receiving flue cause the gases entering from 6 of the small flues to be diverted under the boilers, and those entering by the other two to pass to the heating oven. The arrangement of the boilers and ovens exhibits beautiful symmetry with the greatest economy of space. Standing on either stack and facing the other, on the right hand the boiler stack, with its 5 boilers of 3 feet diameter each, extends 80 feet, covering half the width of the floor, and against its further end stands upon its cast iron pedestal a circular chimney shaft rising 50 feet high. This is of No. 7 sheet iron, $7\frac{1}{2}$ feet in diameter, reduced within by its fire brick lining to 6 feet flue. On the left hand is the heating oven for the blast. This is $24\frac{1}{2}$ feet long, 10 feet wide, and 25 feet high, surmounted with two chimneys. It contains 5 rows of arched oval pipes, 12 in each row. These stand 10 feet high, arranged on 6 bed pipes, and their size within is 8 inches by 4. The blast enters the outer end of the bed pipe furthest from the furnace, and leaves the outer end of the one nearest the furnace passing in an 18 inch pipe straight down the outside of the stack, branching off below to the tuyère arches, and entering the furnace by 4 tuyères in each of the 3 arches. Each furnace thus supplies by precisely the same arrangement the gases for its own heating oven and for one set of boilers. The great gas chamber under the boilers, 6 feet high and 80 feet long, affords the abundant room required for the gases to become thoroughly mixed with atmospheric air, as they are drawn along by the draught of the great chimney. The hot air chamber also has abundant capacity over and under the pipes for the same operation to be thoroughly effected. The flue beneath the bed pipes in this chamber is $4\frac{1}{2}$ feet high. Two powerful steam engines are employed, each one driving a blowing cylinder of $7\frac{1}{2}$ feet diameter and 9 feet stroke, 9 revolutions per minute;

thus, without allowance for leakage, propelling 7,128 cubic feet of air into each furnace. The pressure is 8 lbs.; diameter of tuyères 3 inches. The furnaces within are 18 feet across the boshes at 14 feet above the base. The hearth is 5 feet high, and 7 feet across; diameter at tunnel head 8 feet. The ores employed are hematites with about $\frac{1}{4}$ magnetic ore; fuel anthracite, and the consumption of this when the furnaces are running No. 1 gray iron is about $2\frac{1}{4}$ tons to the ton of iron, for hard iron about $\frac{1}{2}$ ton less. The average weekly production is about 200 tons of iron to each furnace.—*Cost of manufacture.* The legitimate items which make up the cost of producing pig iron are few, and may be valued with tolerable correctness; but beside these are contingencies, such as result from accident and bad management, that cannot be reckoned in any estimate, and frequently swell the expenses per ton beyond all calculations. Without further reference to these, the cost may be considered as made up of ore, fuel, flux, labor at the furnace, interest on capital, repairs, and superintendence. Ore, fuel, and labor are the chief items. The cost of the first two, depending in great part on transportation, varies widely according to the locality and convenience of supply. That of the remaining items is more particularly affected by the magnitude of the establishment, diminishing per ton of iron produced as this increases. Each iron-making district possesses its peculiar advantages; one having ore of excellent quality and cheap, another fuel; another producing iron of superior quality, which by its high value admits of the use of expensive materials; and if another is found possessing all the requisites for the production of the best iron at little cost, its distance from the great markets commonly counterbalances these advantages. Some estimates may be given of the approximate cost of manufacture in a few of the principal districts of the United States. The furnaces on the Hudson river use $\frac{3}{4}$ to $\frac{1}{2}$ hematites from Columbia, and Dutchess cos., N. Y., and the neighboring counties in Massachusetts and Connecticut, and $\frac{1}{4}$ to $\frac{1}{2}$ magnetic ores from Lake Champlain and from the highlands below West Point, the mines not less than 5 m. back from the river. The Champlain ores cost delivered from \$3.50 to \$4.50 per ton; those of the highlands about \$2.50; the hematites from mines owned by the furnace about \$2.25, and from this to \$3. The average for the hematites may be considered \$2.50 per ton, and for the magnetic ores \$3.50. Of the former about two tons, and of the latter one ton are required to the ton of iron. The cost of ores is then \$6.75; anthracite, 2 tons, at \$4.50, \$9; flux, 35 cts.; labor and superintendence, as sometimes done by contract, \$4; total, \$20.10. Repairs and interest on capital may be considered as making the actual cost full \$21. In the great iron district of the Lehigh the ores are supplied from such various sources that the average of their cost is not easy to determine. The magnetic

ores are brought to the furnaces from New Jersey and the hematites from the mines scattered about the valley between the Blue mountain and the South mountain in Lehigh and Berks cos. The magnetic ores are generally valued at about \$3.50 per ton, and for the hematites as much as \$2 per ton is sometimes paid for transportation, and \$1 more for mining, beside 25 or 50 cts. for the value of the ore in the mine. The average cost of the mixed ores is probably about \$3 per ton, and $2\frac{1}{2}$ tons are required to the-ton of iron. The cost per ton of pig iron is then as follows: ores, \$7.50; anthracite, 2 tons, at \$3, \$6; other items as above, \$4.35; total, \$17.85, making the whole cost not far from \$19. The greater convenience of the Hudson river furnaces to the great markets of New York, Troy, and Albany, and the better quality of their iron, fully compensate for the higher cost of production. The furnaces making iron with charcoal for fuel on Chesapeake bay, near Baltimore, run at an average expense not varying materially from the following estimate: ore, $2\frac{1}{2}$ tons, at \$3.62 $\frac{1}{2}$, \$9.06; fuel, $3\frac{1}{2}$ cords, at \$2.50, \$8.75; flux, oyster shells, 30 cts.; labor (including \$1.50 for charring), \$2.75; other expenses, \$2; total, \$22.86. Nothing but the excellent quality of the iron sustains these furnaces, and enables their product to find a market in the rolling mills and nail factories of Massachusetts.

II. MALLEABLE IRON. In the article BLOOMERY, as also in the account in the preceding article of the ancient processes of making iron, some of the methods of producing wrought iron direct are described. To carry out this simple operation with economy upon a large scale has been an object earnestly sought for by metallurgists, and numerous inventions have been patented that have promised to accomplish it. The most important of these, as introducing the general plan followed with various modifications by most of the others, is that of Mr. Clay of England. In this the ore is pulverized, so as to pass through a screen with $\frac{1}{8}$ inch holes, and is mixed with $\frac{2}{3}$ its weight of bituminous coal. It is then introduced through a hopper into a side chamber of a puddling furnace, where it is heated and partially deoxidized; the coal at the same time is coked, and gives the carbon consumed in the partial deoxidizing of the ore. The charge is after this drawn forward into the reverberatory furnace, where it is melted by the flame and puddled and balled by the common method, described below, of converting cast into malleable iron. The process is a scientific one, and is practised with rich ores to some extent in furnaces variously constructed in this country and in Europe. In France a plan has been devised by M. Adrien Chenot, by which the form of the blast furnace on a reduced scale is retained, while the process conducted in it is limited to the deoxidizing of the ore. The furnace is constructed with an outer shell of masonry, with a space included between the two walls into which combustible gases, chiefly carbonic oxide, together with air, are

admitted and consumed to produce the moderate temperature required by the charge of ore in the interior. The reducing agent is carbonic oxide, a current of which is passed through the body of ore. This gas is prepared by decomposing limestone, and passing the carbonic acid gas produced over highly heated charcoal; it is thus made to part with an atom of oxygen, and is transformed from CO_2 to CO . In the furnace it recovers from the ore this atom of oxygen, and the gas is thence conveyed again over heated charcoal to be reconverted into carbonic oxide, and go again the same round, and so on. The whole interior of the furnace is thus appropriated to the ore; but by another plan (in which the same method of heating by an external fire is retained) the charge of ore is mixed with its own bulk of fine charcoal, and a small quantity of air is admitted by openings around the stack half way up to the top. A small portion only of the charcoal is consumed as the charge passes through, and the heat is not allowed to reach the point of fusion, so that none of the iron is converted into cast metal. The lower portion of the furnace is not exposed to the intense heat of the hearth of the blast furnace; and instead of being, as in the latter, the part most highly heated, it is designed as the place for partially cooling the reduced fragments as they descend toward the bottom. There is an arrangement by which from time to time the metal is taken out, and which is so contrived that little air is admitted into the furnace during the operation. In the case of using charcoal, this is separated from the larger masses of metal by screening, and the finer portions are taken up by revolving magnets. The metal is obtained in pieces of the size and shape of the original lumps of ore, but of a porous texture, and, if prepared at a low temperature, exhibiting the singular property of becoming ignited by flame and burning to red oxide. It also oxidizes rapidly by exposure to moisture. Conducting the process at a temperature somewhat higher than the minimum required for reduction corrects this tendency. The spongy iron, ground to powder and submitted to pressure, forms coherent masses which may be worked under the hammer as in ordinary forging; or they may even be pressed into moulds, and thus present moulded objects in malleable iron. The porous sponge, when plunged into oil or melted tar or resin, absorbs a portion of the carbonaceous liquid; and when it is afterward exposed to low red heat, a portion of the carbon is retained, converting the metal into steel. At Clichy, near Paris, works were constructed in 1858 for the manufacture of steel by this method. In the article METALLURGY it is proposed to revert to this subject, and give an account of various experiments upon a large scale which have been undertaken and are now in progress in the United States for the manufacture of malleable iron direct from the ore with mineral coal.—*Conversion of cast into malleable iron.* The best malleable iron is

made direct from the ore in charcoal forges; but these cannot supply the demands of commerce. Cheaper but poorer qualities of iron are obtained in the immense quantities required by converting the pig iron of blast furnaces into wrought iron by the process of puddling. Poor ores are thus made useful, which could never be employed for producing malleable iron direct. The converting process consists in separating the carbon that gives to cast iron its peculiar qualities; and it is also intended to remove as much as possible other impurities, as sulphur, phosphorus, silicon, &c., which poor ores and poor fuel leave with the cast iron. The higher qualities of pig iron are most easily decarbonized—the white brittle irons, which contain the most carbon, but in the state of chemical combination with the iron, and the mottled variety. These are commonly classed as forge pig. They are the cheapest product of the blast furnace, made most rapidly and with least consumption of fuel. In ancient times pig iron was refined altogether in low forge fires like bloomeries, with charcoal for fuel, and with blast. Heated for a time in these, the iron lost its carbon, and, being removed from the fire in a softened mass, was immediately drawn down under the hammer. This process, variously conducted, is still in use in Europe. It involves a large waste of iron, generally more than 20 per cent., consumes a great quantity of fuel, and requires power for the blast; but the quality of the product is much superior to that obtained by the later process, now generally substituted for it and known as puddling. This was invented by Henry Cort about the year 1780. He first decarbonized cast iron by subjecting it to the bituminous coal flame of a reverberatory furnace; but his succeeding experiments gave irregular results as to the quantities of iron lost and of fuel consumed, as well as to the quality of the metal. He next caused the process to be preceded by a fusion of the pig iron with coke for fuel, running out the metal in flat cakes upon a cold metallic surface, and chilling it with water, after which it was more easily decarbonized. It is still the custom in England to prepare pig iron for puddling by this preliminary operation; and by directing the blast of the tuyères down upon the melted iron it causes a partial separation of carbon, phosphorus, and silicon. The practice is called refining, and the product is termed finery or fine metal. Where it is adopted in the United States, as in some parts of Pennsylvania, the furnaces are termed run-out fires. Cort also introduced rolls to take the place of hammers for drawing the malleable iron into bars. His discoveries, which gave to poor ores and bituminous coal an immense importance in the manufacture of iron, were the foundation of the wonderful progress soon made by Great Britain in this branch of industry. Refinery fires are now regarded as by no means essential unless for very bad metals; and instead of this second fusion, the pig iron is in some for-

eign establishments prepared to the same purpose in blast furnaces when of small size, by directing the tuyères for an hour or two before casting down upon the surface of the metal, and when it is run off chilling the pigs or plates. The Styrians adopt a very similar method. They run the crude iron into an oval cavity in the sand, and then clear off the cinder and chill the liquid iron by sprinkling cold water upon it. Plates are thus formed one after another, nearly one every minute, weighing 25 or 30 lbs. each. They are then taken out and roasted 10 or 12 hours at a red heat in an oven or an open pile, and much of the carbon is thus expelled, but with considerable waste of fuel. The French make chilled plates directly from the blast furnace, calling the operation *blanchiment*; the second fusion, and also the operation of blowing upon the iron in the hearth of the blast furnace, they call *mazéage*, and recommend chilling the metal in cast iron moulds lined with quicklime or chalk. They then roast the plates, in which operation white irons are rapidly decarbonized.—The puddling process is conducted in reverberatory furnaces, in which the cast iron placed upon the hearth to be melted is separated from the fuel, the solid impurities from which might injure it by admixture. The flame passes over the bridge, and is reflected from the low roof of the furnace down upon the metal. Flaming coals make the best fuel, but wood, peat, and anthracite are used; with the last, however, it is necessary to drive the fire by a fan blower, the tall chimney not causing sufficient draught for this dense fuel; in the United States the blower is generally in use for bituminous coal fires also. The furnaces are made both single and double; the latter is an American improvement, and is generally in use east of the Alleghanies. Double furnaces are like single ones, except that they have a larger surface and a working door on 2 opposite sides. They measure outside 12 to 13 feet in length, and $6\frac{1}{2}$ to $7\frac{1}{2}$ in width; the area of the hearth is about 40 square feet, and the grate surface is seldom less than 15 feet. The hearth or working bottom occupies a depression 6 inches or more deep behind the bridge, and around it are inserted hollow boshes of cast iron, open at the ends for the circulation of air; a portion of the blast is often passed through for the sake both of heating this and keeping the boshes cool; sometimes also water is made to circulate through them. The floor is of cast iron, and covered with pulverized cinder, which before the furnace is charged is thoroughly fused so as to form a complete layer over the hearth 2 inches or more thick. The furnace is of fire brick, the whole incased in cast iron plates securely bound together outside with heavy bars of iron. The chimney is at the opposite extremity to the fire place. Before charging with iron, an addition of iron scales or cinder is made to the bed already hardened upon the hearth, and some pulverized magnetic iron ore is sometimes thrown in. The pig iron or plate

metal is advantageously prepared for the process by heating it in an oven connected with the escape flue for the flames into the chimney. It is in pieces less than 28 lbs. weight each, and is thrown in in a charge for a single furnace of 350 to 500 lbs., and double the quantity in a double furnace. The doors are then tightly closed, and so kept while the fire is urged for 10 to 15 minutes. The pieces having then attained a bright red heat, the workman through the working hole in the door adjusts them with an iron bar, so that they may acquire a uniform temperature. In less than half an hour they arrive at a condition in which they may be broken into small fragments, which is effected by the use of the bar working through a hole in the door. When these fragments are about to melt, the damper is lowered and water is thrown in, in small quantities at a time, for the purpose of cooling the charge. Instead of water alone, pulverized magnetic or other rich iron ore, or scales, or cinder from the rolls or hammer, may be added. The puddler stirs the iron one way and the other, breaking up any lumps which may remain, and continues to throw in water and scales upon those portions which are on the point of melting, and this he does until the cast iron is reduced to a pulverulent state. He then gradually raises the damper at the top of the chimney and increases the heat, stirring the iron, which he does not allow to melt, and continues the operation until the iron assumes the characteristics of wrought iron, which the workman calls "coming to nature." The heat is then still further increased, and the pasty metal is worked by the bar or ringer into balls. This is the most laborious part of the operation, and requires the greatest skill, to separate the fully reduced from the raw metal, and to avoid too large agglomerations. The balls are 12 to 15 inches in diameter and 70 to 100 lbs. weight each, and are formed by gradual gathering up and pressing together of the reduced particles, very much in the same manner as a snowball is rolled up and pressed into a solid mass. As each one is formed the puddler lays it up against the bridge to protect it from the oxidizing action of the flame, and to afford room for the formation of other balls in the same manner. After the metal is entirely made up into balls, the furnace is closed for a few minutes to give them all a thorough heat. After this the charging door is raised and the balls are taken out one after another, and dragged by the tongs or brought by an iron hand carriage or a swinging crane to the hammer or squeezer. Various modes of puddling are practised. One which differs the most from that just described is known as the boiling process. In this the scales, ore, or cinder, in the proportion sometimes of 50 per cent., are charged with the pig iron, and the fire is kept up without check, melting the mixture, no scales nor water being introduced to cool the metal and bring it to a pulverulent state, as in the other process. The same method of working the charge with the

bar is practised, until the iron begins to come to nature. At this time the cinders swell up and boil so as to fill the hearth and sometimes flow out of the door. For this reason, in order that the boiling process may have full scope, the hearth is made considerably deeper than in the ordinary puddling furnace. As the iron becomes refined, the boiling subsides, and the cinders settle down. When the refining is complete, the iron has lost its liquidity and collects together in lumps of a brilliant white heat. These the puddler turns about to expose all parts successively to the flame, and cuts them apart, so that all portions shall be completely refined, after which he forms the metal into balls as before described. The boiling motion is caused by the oxidation of the carbon and the iron, and the escape of the gases thus formed, which burn with a blue flame upon the surface of the metal. The puddling operation requires from $1\frac{1}{2}$ to nearly 4 hours, according to the quality and condition of the metal charged; the longest time is when the boiling process is adopted. The iron in the puddling loses its carbon and a greater or less proportion of the other impurities, as silicon, phosphorus, sulphur, &c., according to the nature of the pig iron and the manner in which the process has been conducted. A portion of the iron is also oxidized, forming the basis of the cinder. All wrought iron of commerce retains a trace of carbon, which, so far from being injurious, is believed to render iron better adapted for ordinary purposes. The total loss of weight, including that which occurs afterward under the hammer, is sometimes averaged at 15 per cent. When anthracite is employed for fuel, its consumption is from 1,700 to 2,240 lbs. for the ton of rough bars. Beside the materials named, which are employed in puddling, scrap iron is profitably used when procured at low prices. It is cut up in small pieces and thrown in, 50 or 75 lbs. at a time, just before the iron is ready for balling. The practice of working rich magnetic ores in considerable quantities is of American introduction, and is generally adopted in the United States, improving the quality of the product and diminishing the time of the process; in many cases also it entirely compensates for the waste. In the use of inferior pig iron the quality of the product is improved by subjecting the whole or a part of the pig iron to a previous fusion in what is known as a finery fire. In this the fuel is thrown in upon the charge of pig metal and cinders. The combustion is maintained by a blast directed through a tuyère pointing down through the cinder upon the iron. After the metal has been some time subjected to this process, it is drawn off in a melted state and run into plates called plate metal or fine metal, a product intermediate between pig and malleable iron. Silicon and phosphorus are removed, and thus the iron is refined, the proportion of carbon not being sensibly reduced. Refining is little practised in the United States, but in England, where fuel is not so much of an object

and the pig iron used is often of poor quality, it is more common. Various other modifications of the puddling process are in use. In some furnaces jets of air are blown in over the fire bridge wall, effecting more perfect consumption of the gases, and hastening the operation. At the Bolton iron works in England a method of puddling patented by Mr. James Nasmyth is in use, which is highly spoken of. A jet of steam at about 5 lbs. pressure is discharged by a pipe in the hands of the workman directly into the iron as soon as it has melted, and the nozzle bent down is stirred about in the iron, distributing the steam in all portions of it. In 5 to 8 minutes the mass thickens, the pipe is withdrawn, and the operation is finished in the ordinary way. It is estimated that from 10 to 15 minutes of the hottest and most severe portion of the work are saved by this method, the philosophy of which is already explained in noticing the use of water. Puddling furnaces are sometimes arranged so as to receive the crude iron directly from the blast furnace, thus making a considerable saving in fuel.—The operations that succeed the puddling, by which the balls are converted into bars, rails, &c., are of a mechanical character. Under the hammer or in the squeezer which compresses them, the cinder is forced out, and they are reduced into elongated blocks called puddlers' blooms. The process is called shingling. In the squeezer they are compressed as between the jaws of an immense vice, which opens and shuts as worked by an eccentric or by cranks. In the squeezer invented by Mr. Henry Burden, which is generally used in the United States, the ball is rolled around and most thoroughly squeezed, as it is drawn in by the serrated face of an upright iron cylinder, made to revolve within an eccentric cast iron shell, also furnished with a serrated face opposed to that of the cylinder, and with an aperture left open for introducing the ball between them. Their centres not being the same, the ball as it is carried round is made to pass through the narrowing space, till it is finally thrown out as it arrives on the opposite side of the aperture or break in the outer circle. In one invented by Mr. Winslow of Troy, N. Y., the ball reposes upon two parallel rollers and is squeezed by the revolution of an eccentric cam, and at the same time the ends of the blooms are upset by a spring hammer. The English employ a much more complicated squeezing machine, known as Brown's bloom squeezer. By thorough hammering and rolling the quality of the iron is materially improved, being made more dense and uniform in texture. When the puddlers' ball has been shingled into a bloom, it is taken to the roughing rolls to be drawn down. In some European countries peculiar forms of rolls with flat faces are used instead of hammers and squeezers; but in these the iron cannot be so thoroughly compressed, and they are also objectionable on account of the edges of the bars becoming very rough and hence causing much waste. The

roughing rolls in common use in the United States are so constructed as to leave between the pair of cast iron cylinders, made to revolve close together and one above the other, lozenge-shaped openings, through which as the bloom is drawn it is elongated, while at the same time the edges are kept even, and the bloom in good shape for making round, flat, or square bars. To reduce bars from 6 inches to 1 inch square, they should be passed, if of hard iron, through 9 grooves of gradually diminishing sizes; if the iron is soft, 6 may answer. Those which are used for flat bars are arranged along the rolls, each successive one gaining in width and lessening in height, or in the space between the two rolls. Projecting ribs around the lower roll determine the width of each space and play in corresponding depressions around the upper roll. The diameter of roughing rolls is from 18 to 20 inches. Different forms are given to the rolls, according to the various shaped bars required; some are very complicated and demand much ingenuity in their construction, like some of those used for railroad iron. The iron turned out by the roughing rolls requires other processes to convert it into finished bars; it is apt to be hard and brittle, with many flaws and imperfections. The rough bars are first cut into short lengths by shears of great power worked by machinery; they are then made up into piles, which are placed on the hearth of a "re-heating furnace," much like a puddling furnace, contrived to exclude oxygen as much as possible from the hearth, as this causes a scale upon the iron. When softened down by a welding heat, they are passed through a train of rolls of superior construction, called finishing rolls. In the merchant mill a great variety of these are in use, adapted to the different sizes of iron required. Some are arranged three together, one above another, by which the operation is expedited, inasmuch as the bar is then rolled as it passes each way, first below and then above the middle roll. It is important to run the bars through as rapidly as possible in order to avoid successive heatings, the effect of which is to injure the metal. Some rolls are made to draw iron down to $\frac{1}{4}$ inch diameter; for smaller sizes the rods are drawn through wire plates. Flat iron for hoops is rolled down to $\frac{5}{8}$ inch in width and $\frac{1}{16}$ inch in thickness. Sheet iron is passed under great pressure through hard and well polished rolls, which are kept at a low temperature and several times reheated. For this use it is essential that both the fuel and the iron should be entirely free from sulphur. Charcoal is found to be the best fuel, and superior qualities of gray pig make the best sheets. The ovens for reheating are of peculiar form, specially designed to protect the iron from the ill effects of the fuel. To render the surface of the sheets perfectly clean as they pass into the rolls, a scraper is so adjusted as to rub hard upon them, removing all scales of oxide of iron, which would injuriously affect their polish and color. It is only by such precautions that the blue

color so much prized in this form of iron is secured. Sheets for tinning are subjected to hydraulic pressure between two smooth surfaces of cast iron, or by passing them cold through rolls. The high perfection to which this process has been carried was shown in specimens at the Breslau exhibition in 1852. A hundred weight of iron was made to cover 7,040 square feet, indicating a thickness of 250 leaves to the inch. A bookbinder of Breslau exhibited a book made of it, the leaves of which might be printed upon, being as flexible as paper. Boiler plate iron is rolled at one heat from a slab forged under the hammer, 12 to 18 inches long, 7 to 10 wide, and 2 to 3 inches thick, heated in a reheating furnace to a bright red, but not welding heat. As it is rolled the iron is repeatedly sprinkled with water, which chills the surface, causing the scale to fall off. This will not do, however, for the fine qualities of sheet iron, in preparing which the use of water is carefully avoided.—New methods of producing wrought iron are continually brought to public attention; but few of them stand the test of use. The chemical changes which cause the different kinds of iron to pass into each other are so slight, that the temptation is very great to endeavor to bring these about by simpler processes than those in use, or by forms of furnace and apparatus that seem to experimenters better adapted to the purpose. Several of these new methods are no doubt worthy of special notice; but in their great number one may well fail to select the most deserving. A method of improving the quality of wrought iron, and also of inducing changes in its composition by the introduction of certain alkaline and carbonaceous fluxes to the iron while fused in crucibles, was devised by Prof. A. K. Eaton of New York, and has been applied on a large scale with great success to the production of superior qualities of cast steel. It will be particularly described in the article STEEL. In 1856 was patented Bessemer's process, which was expected at the time to make a complete revolution in the manufacture of malleable iron and steel, but which, though very promising in theory and experiment, has so far proved of little practical importance. The principle of it was to burn out the carbon from the melted crude pig iron, as received from the blast furnace, by blowing atmospheric air through it, the chemical operation evolving the heat required to keep the mass in fusion. Thus no impure fuel or gaseous products of combustion were brought in contact with the iron, and the impurities introduced with this were taken up by the oxide of iron generated in the process, which formed with them a cinder easy of separation. The process was successfully tried in a cylindrical furnace of 3 feet diameter and 5 feet height, lined with fire bricks. Two inches above the bottom were the apertures for 5 tuyères of $\frac{3}{8}$ inch nozzles, made of fire clay. On one side half way up was a hole for letting in the iron from the hearth of the blast furnace, and opposite was

another hole for running it out when necessary. The charge was from one to 5 tons, filling the cylinder far above the tuyères. The blast, at a pressure more than sufficient to counterbalance that of the column of iron, was let on as this was introduced. Immediately the melted iron was thrown into commotion like boiling, being dashed about and shaking with violence the furnace that contained it. Flame and sparks issued from the top. The combustion of the carbon in the iron caused great increase of temperature, and in the course of 15 or 20 minutes an immense increase in the volume of flame seemed to indicate that the carbon chemically combined with the iron began to be attacked. The metal frothed up several inches above its former level, and a violent eruption of cinder in foamy masses took place, continuing several minutes. As this subsided, a steady and powerful flame succeeded to the shower of sparks and cinders which always accompanied the boil. The oxide of iron generated immediately acted as a solvent of the earthy impurities, separating them from their combination with the metal, and the volatile impurities were expelled by the powerful heat as well as by their affinity for the oxygen presented to them. In 4 trials the average loss of weight was found to be $12\frac{1}{2}$ per cent, which would be increased perhaps to 18 per cent, in passing the iron through the rolls, but might again be reduced by treating with carbonaceous gases or fluxes the rich oxides thrown out during the boil, which contained numerous grains of metallic iron taken up mechanically by the cinders. The disappearance of the flame indicated the complete combustion of the carbon and the proper time to draw off the melted metallic iron. This was received into ingot moulds, free from cinder, oxide, and other extraneous matter, and ready at once for the hammer or the rolls. Mr. Bessemer remarks: "It will thus be seen that by a single process, requiring no manipulation or particular skill, and with only one workman, from 3 to 5 tons of crude iron pass into the condition of several piles of malleable iron in from 30 to 35 minutes, with the expenditure of about $\frac{1}{3}$ part of the blast now used in a finery furnace with an equal charge of iron, and with the consumption of no other fuel than is contained in the crude iron." The amount of heat disengaged during this operation was very extraordinary, and the surplus was more than sufficient to remelt all the waste pieces of metal and convert them into ingots of the same quality with the rest. An analysis of some of the iron, however, shows that phosphorus and sulphur are not entirely expelled. It gave the following result: iron 98.90; carbon 0.05; sulphur 0.16; phosphorus 1.08. Other difficulties were experienced or apprehended in the uncertainty as to the time of drawing off the metal—too short exposure to the air failing to decarbonize and purify the crude metal, and too long exposure rendering it liable to be attacked at the excessively high temperature by the oxygen of the blast, pro-

ducing the condition commonly called burnt. The failure of the process, so far as the manufacture of malleable iron is concerned, is in reality to be attributed to the combustion of the iron itself. It is this that produces the high temperature observed, and causes a waste of the metal ruinous to the economy of the operation. It would seem, however, from some recent notices in the *Annales des mines*, that it is successfully applied in London to the manufacture of steel.—Small articles of cast iron are converted into malleable iron by subjecting them to red heat continued for several days, while they are buried in oxide of iron, which may be either scales of iron rust or pulverized specular iron ore. The oxide gradually yields its oxygen to the carbon of the cast iron, and this is rendered malleable. Numerous articles are thus first cast which could not be used in a brittle state, such as buckles and mountings for harness, butts for doors, joints for gas pipes, &c. The material, as it becomes deoxidized, prevents the contact of fresh portions of oxide with the cast iron, and the operation is consequently impeded. An ingenious method of avoiding this difficulty has been devised by Prof. A. K. Eaton, and put in successful practice. He substitutes an oxide of a volatile metal, as zinc, which being reduced leaves nothing fixed, while the vapor which arises is condensed and the metal is obtained. Thus zinc ore is reduced and malleable castings are produced by the same operation, and instead of occupying from one to two weeks the process is completed in 12 hours. III. STATISTICS. Of all the iron produced in the world, Great Britain furnishes more than one half. Previous to the year 1740 the production of that country had amounted to 180,000 tons per annum. This was all made with charcoal for fuel, but in 1740 the supply of this had become so exhausted that the production of iron had fallen to 17,350 tons per annum. The number of furnaces was 59, each one consequently making an average yield of only about 294 tons. Coke being soon after introduced, the total production in 1788 had risen to 68,300 tons, of which only 14,500 tons were made with charcoal. In 1796 the total production was 124,879 tons, each furnace making 1,032 tons; in 1800 it was 180,000 tons; and in 1806 the production was 253,206 tons, each furnace averaging 1,546 tons per annum, and the best making 2,615 tons. The uses of iron had greatly increased with the facilities for its production, and the quantity consumed per head of population was 40 lbs. in place of only 15 lbs. in 1740. The progress of the manufacture is shown by the following number of tons produced for the years named:

Years.	Tons.	Years.	Tons.
1818	300,000	1839	1,243,751
1820 (Mushet)	400,000	1840	1,396,400
1823 (official)	452,066	1845	1,512,500
1825	581,367	1847 (official)	1,999,608
1827 ("Encyc. Brit.")	690,500	1852	2,701,000
1830	675,417	1854 (Truran)	3,555,906
1833 (Dr. Cleland)	700,000	1855 "	4,399,886
1836	1,000,000		

The number of furnaces in 1854 was 599, the average annual product of each 6,000 tons, and the total value of the product was rated at \$125,000,000. The following table, made up from the mining records, and published for the museum of practical geology, London, shows how this production was distributed through Great Britain in 1854. The total product is rated somewhat less than by Truran, as given above:

Counties.	No. of works.	No. of fur- naces erected.	No. of fur- naces in blast.	Total product in tons.
ENGLAND:				
Northumberland, Durham, and Yorkshire.....	37	106	80	348,444
Derbyshire.....	13	33	25	127,500
Lancashire and Cumberland.....	2	5	3	20,000
Staffordshire.....	72	203	166	847,600
Shropshire.....	13	34	23	124,800
Gloucestershire.....	4	7	5	21,990
WALES:				
Flintshire and Denbighshire.....	7	11	9	32,900
Glamorganshire, anthracite.....	14	35	21	750,000
Glamorganshire and Monmouth- shire, bituminous.....	34	134	100	
SCOTLAND:				
Ayrshire.....	9	41	30	249,600
Lanarkshire.....	13	58	72	468,000
Other counties.....	10	27	16	79,040
Total.....	228	724	555	3,069,874

Truran's estimate for 1855 is as follows:

Districts.	No. of furnaces.	Mean weekly product of each furnace.	Annual production.
South Wales.....	169	118	1,042,776
" anthracite.....	37	72	139,580
Dean Forest, N. Wales, and Lancashire.....	33	67	115,460
South Staffordshire.....	169	108	948,520
North Staffordshire.....	19	104	102,260
Derbyshire.....	30	101	158,080
Shropshire.....	34	86	157,720
Yorkshire.....	31	72	116,450
Northumberland.....	79	132	541,320
Scotland.....	145	145	1,082,640
Total.....	746	113	4,899,836

The production of all countries for the same period has been estimated as follows:

Tons.	Tons.
Great Britain	3,555,906
France.....	750,000
Prussia.....	300,000
Austria.....	250,000
Belgium.....	250,000
Russia.....	200,000
Sweden.....	100,000
Various Ger. states.....	100,000
United States.....	750,000
Other countries.....	300,000
Total	6,635,906

—The statistics of the iron manufacture of the United States have been very imperfectly collected and preserved. In the census returns it was generally the case that no discrimination was made between the different kinds of furnaces and forges, whether they worked the ores into pig metal or malleable iron, or were employed in the secondary operations of remelting or puddling. The establishments of these various kinds all worked independently, making no returns of their operations; and the extreme fluctuations to which the business was subjected

also added to the difficulties of obtaining accurate results. In 1850 the association of iron manufacturers, organized at Philadelphia, made the first systematic attempts to obtain full and exact accounts of the production of the state of Pennsylvania. These were collected by the efforts of Mr. C. E. Smith, and published together with papers by other members of the association on the cost of making iron, &c., in a small volume. In 1856 the American iron association undertook the task of extending these researches throughout the Union, and obtained authentic statistics of the manufacture in the United States and Canada for the preceding 3 years, including returns from 832 blast furnaces, 488 forges, and 225 rolling mills in the United States. The data collected, chiefly by Mr. J. P. Lesley, secretary of the association, and compiled by him and Mr. Charles E. Smith, treasurer, were published in the papers of the association. The results given below are from this source. The field of production was found to naturally divide itself into 10 or more geographical iron centres, irrespective of state lines, which are here presented, although it will be more satisfactory to class the production by states and portions of states, with subdivisions expressive of the various sorts of furnaces and forges. The centres referred to are thus arranged: 1. N. New York, formerly including Vermont, using magnetic and specular ores, with 40 bloomeries and a few blast furnaces, 3 of which in 1856 were anthracite. [In this grouping no place seems to have been provided for the 7 or 8 blast furnaces of the Oneida lake fossil ore region, which is really another special district. But it is believed the production of pig iron of this district is included in making up the aggregate.] 2. The highland belt, extending S. from the Vermont line through W. Massachusetts and Connecticut, including the furnaces of the Hudson river and N. New Jersey to the Delaware river, with 44 charcoal and 22 anthracite furnaces and 60 forges, using hematite and magnetic ores. 3. E. Pennsylvania and N. E. Maryland, with 98 anthracite furnaces, 103 charcoal furnaces, and 117 forges; none of the last, however, are for reducing the ores. This great district is itself divisible into several, some of which use magnetic, some hematite, and some fossil ores. 4. N. W. Virginia and S. W. Pennsylvania form a distinct district on the E. outcrop of the lower coal measures, with 42 charcoal and coke furnaces and 2 or 3 forges using the carbonates of iron; it includes the recently constructed Cambria works, which have greatly increased its product. 5. N. W. Pennsylvania and N. E. Ohio, with 66 furnaces, using the ores of the northern outcrop of the lower coal measures. The charcoal furnaces of this region are all going out, and the coke and raw bituminous coal furnaces are increasing in number, size, and efficiency. All the forging of this region is done by the rolling mills and workshops of Pittsburg and other centres of trade upon the Ohio waters. 6. The Hanging Rock or Ironton region is a belt 15 m.

wide and 100 m. long, occupying each side of the Ohio river, and having 45 furnaces in Ohio and 17 in Kentucky. Its ores are from the lower coal measures, and at its N. end bituminous coal is beginning to be used for fuel. 7. The old manufacturing region of middle and E. Virginia is a prolongation southward of the E. Pennsylvania, with the same ores, but using charcoal exclusively as fuel. On the E. of the Blue Ridge were 16 furnaces (only one of which remains in blast), and on the W. 30. There are 35 forges. 8. N. E. Tennessee and N. W. North Carolina have 9 furnaces and 41 bloomery forges in a compact area, using the hematite and magnetic ores of the highland range. Along the base of the Cumberland mountains 5 furnaces and 14 forges use the Dystone fossil (upper silurian) ore. In the S. W. corner of North Carolina are 5 forges; and through the middle of the state runs a belt of 5 furnaces and 27 forges. A few more are in the Allatoona region of Georgia. The whole country possesses incalculable resources for iron making, and must become at some distant day one of the great centres. 9. In W. Tennessee and Kentucky, around Clarksville and Eddyville, lies the principal, and at present only important region of the far West; it contains 45 furnaces and some forges. 10. In Missouri a beginning has been made in the Iron mountain district, with 7 furnaces, using the specular ores and hematites. The region about the Iron mountain and Pilot Knob must become a very important one, when supplied with coals from W. Missouri and Kansas. The Lake Superior iron region is rapidly becoming an important centre, supplying already many furnaces in Ohio and southern Michigan, and also three in the region itself, beside many bloomery fires. The following table exhibits the distribution of the works through the several states in 1858 in operation and abandoned:

States.	Anthracite furnaces.	Charcoal and coke.	Abandoned furnaces.	Bloomery forges.	Abandoned bloomeries.	Refinery forges.	Abandoned refineries.	Rolling mills.	Abandoned.
Maine.....	1	..	..	..	..	..	..	1	..
New Hampshire.....	1	..	..	..	..	1	..	..	..
Vermont.....	5	..	5	..	..	..	..	1	..
Massachusetts.....	3	7	..	..	..	5	1	19	..
Rhode Island.....	..	..	..	..	..	..	..	2	..
Connecticut.....	1	14	..	..	..	6	..	5	..
New York.....	14	29	6	42	1	3	2	11	5
New Jersey.....	4	6	12	48	29	2	..	10	1
Pennsylvania.....	93	150	102	1	3	110	44	91	5
Delaware.....	..	..	1	..	..	..	..	4	..
Maryland.....	6	24	1	..	..	..	..	13	..
Virginia.....	..	39	56	..	..	43	..	12	..
North Carolina.....	..	3	3	86	..	..	..	1	1
South Carolina.....	..	4	4	2	..	..	..	3	..
Georgia.....	..	7	1	4	..	..	..	2	..
Alabama.....	..	3	1	14	..	..	..	..	..
Tennessee.....	..	41	33	50	2	9	3	3	2
Kentucky.....	..	30	17	..	..	4	9	8	..
Ohio.....	..	54	26	..	..	..	5	15	..
Indiana.....	..	2	3	..	..	..	..	1	..
Illinois.....	..	2	..	..	..	..	..	1	..
Michigan.....	..	7	..	3	..	..	..	2	..
Wisconsin.....	..	3	..	..	..	..	..	..	..
Missouri.....	..	7	..	..	..	3	..	5	1
Arkansas.....	..	..	..	1	..	..	..	..	..
Total.....	121	459	272	203	85	156	64	210	15

Working, 560 furnaces, 389 forges, 210 rolling mills=1,159
 Abandoned, 272 " 99 " 15 " " = 386
 In all, 832 " 488 " 225 " " =1,545

The production of pig iron of different kinds for 1854, 1855, and 1856, in tons, as distributed in different districts, was as follows:

Fuel.	Districts.	1854.	1855.	1856.
Anthracite	Pennsylvania.....	208,603	255,826	306,972
"	Out of Pennsylvania.....	99,007	87,779	87,537
Charcoal and coke	S. Ohio.....	56,081	47,982	70,455
"	E. Kentucky.....	22,929	16,180	21,661
"	W. Pennsylvania.....	78,927	59,888	59,597
"	N. Ohio.....	11,289	9,926	17,056
"	E. Pennsylvania.....	62,724	60,596	52,775
Charcoal	W. Tennessee.....	87,918	38,683	82,162
"	W. Kentucky.....	12,236	13,664	14,902
"	S. Indiana.....	1,400	1,500	1,800
"	S. Illinois.....	1,500	1,500	1,800
Charcoal and coke	S. W. Pennsylvania.....	11,052	13,217	29,400
"	N. W. Virginia.....	1,930	2,342	1,467
"	Maryland.....	36,658	36,309	30,993
Charcoal	E. of the Hudson.....	30,420	82,826	29,937
"	N. and W. New York.....	19,197	19,736	18,847
"	Missouri.....	7,591	10,181	10,183
"	S. New York and N. New Jersey.....	13,435	7,901	5,683
"	E. and Middle Virginia.....	5,880	6,926	5,730
"	North and South Carolina.....	1,820	1,830	1,956
"	Georgia.....	2,891	2,715	2,807
"	E. Tennessee and Alabama.....	1,845	1,516	2,931
"	Michigan.....	990	950	6,173
"	Wisconsin.....	.....	.....	2,500
Total production of pig metal in the United States.....		724,833	728,973	812,917

Increase of production from 1854 to 1855, 4,140 tons, or .6 per cent.; from 1855 to 1856, 83,880 tons, or 11 per cent.; from 1854 to 1856, 83,020 tons, or 12 per cent. Of the 812,917 tons of pig iron produced in 1856, it is computed that 52,325 tons were consumed by the forges, 423,428 by the rolling mills, and 337,154 by the founderies. Whatever discrepancies are observed in comparing the tables which follow with the preceding ones are due to the interval of 2 years between their dates, as explained in the report. The first series specifies the number of works running, or in running order, in the several states in 1856, with the quantities of pig iron of different kinds produced, arranged as follows: 1, anthracite; 2, coke; 3, raw bituminous coal; 4, charcoal; 5, blooms and bars made direct from the ore.

States.	Furnaces.	Product, tons.
1. Massachusetts.....	3	3,443
Connecticut.....	1	.....
New York.....	14	47,257
New Jersey.....	4	26,117
Pennsylvania.....	93	306,972
Maryland.....	6	10,720
Total anthracite.....	121	394,509
2. Pennsylvania.....	21	39,953
Maryland.....	3	4,528
Total coke.....	24	44,481
3. Pennsylvania.....	6	8,417
Ohio.....	13	16,656
Total bituminous.....	19	25,073
4. Maine.....	1	2,100
New Hampshire.....	1	.....
Vermont.....	5	2,420
Massachusetts.....	7	8,564
Connecticut.....	14	12,876
New York.....	29	21,774
New Jersey.....	6	2,100
Pennsylvania.....	143	96,154
Maryland.....	21	26,470
Carried forward.....	227	172,458

States.	Furnaces.	Product, tons.
Brought forward.....	227	172,458
Virginia.....	39	14,832
North Carolina.....	3	450
South Carolina.....	4	1,506
Georgia.....	7	2,807
Alabama.....	3	1,495
Tennessee.....	30	38,563
Kentucky.....	41	70,855
Ohio.....	2	1,800
Indiana.....	2	1,800
Illinois.....	2	1,800
Michigan.....	7	3,673
Missouri.....	3	10,183
Wisconsin.....	7	2,500
Total charcoal.....	416	348,854
Total pig.....	530	812,917
5. Vermont.....	5	1,650
New York.....	42	13,710
New Jersey.....	43	4,487
North Carolina.....	36	1,182
South Carolina.....	2	640
Georgia.....	4	40
Alabama.....	14	252
Tennessee.....	50	1,222
Michigan.....	3	450
Total blooms and bars direct.....	204	23,633
Grand total production of iron from the ore.....	.....	841,550

The average value of anthracite iron at Philadelphia in 1856 was \$25 per ton, making the product of that year equal to \$9,862,725; in 1858, \$20=\$7,890,180; of coke in 1856, \$25=\$1,112,025, and in 1858, \$21=\$934,101; of bituminous in 1856, \$25=\$626,825, and in 1858, \$21=\$526,533; of charcoal in 1856, \$30=\$10,465,620, and in 1858, \$24=\$8,392,496; of blooms and bars in 1856, \$50=\$1,081,650, and in 1858, \$37.50=\$811,237. Total value of the product of 1856 at the prices of that year, \$23,148,845; at those of 1858, \$18,554,547. Of the production of blooms and bars direct from the ore, 21,633 tons consisted of the former, and 7,000 tons of the latter. The largest market for this variety of iron is Troy, N. Y. The

quantity of iron of all kinds used in every form of domestic manufacture is estimated as follows for the year 1856:

Total product of the mines.....	841,550 tons.
Scotch pig imported for foundries.....	55,403
Rolled and hammered iron imported.....	298,275
Scrap imported.....	10,320
Estimated old rails reworked.....	363,998 "
Scrap collected and sold.....	101,000
	25,000

Grand total of iron consumed.....1,330,543 "

The following table presents the rolling mills and their operations for 1856:

States.	Mills	Product, tons.	States.	Mills	Product, tons.
Maine.....	1	4,500	South Carolina.....	3	1,210
Vermont.....	1	500	Georgia.....	1	900
Massachusetts.....	19	55,292	Tennessee.....	3	2,639
Rhode Island.....	2	4,475	Kentucky.....	17	16,365
Connecticut.....	5	5,759	Ohio.....	15	30,980
New York.....	13	55,172	Indiana*.....	1	.....
New Jersey.....	10	28,483	Illinois*.....	1	.....
Pennsylvania.....	91	241,484	Michigan.....	2	1,843
Delaware.....	4	2,211	Missouri.....	4	4,420
Maryland.....	13	14,812			
Virginia.....	12	26,355	Total.....	209	498,081
North Carolina.....	1	215			

The rolled and hammered iron obtained from all sources, and consumed in the United States in 1856, consisted of the following items:

Description.	Domestic prod'ct, tons.	Imported, tons.	Total, tons.
Rails.....	142,555	167,400	309,955
Boiler and sheet.....	38,639	15,033	53,692
Nails (2,645 machines).....	81,462	.....	81,462
Bar, rod, band, and hoop.....	235,425	115,822	372,247
Hammered bars and shapes.....	21,000	.....	21,000
Total.....	519,081	298,275	817,356

The value of the products of the manufacture of domestic iron is thus given at the prices current in 1856:

Foundry pig.....	302,154 tons, @ \$27,	\$8,153,153
" cold blast charcoal iron for car wheels, &c.....	35,000 "	@ 25, 1,225,000
Rails.....	142,555 "	@ 63, 8,950,965
Boiler and sheet.....	38,639 "	@ 120, 4,636,680
Nails.....	81,462 "	@ 84, 6,842,808
Bar, rod, band, and band.....	235,425 "	@ 65, 15,302,625
Hammered iron.....	21,000 "	@ 125, 2,625,000
Total.....	857,235 "	\$47,771,236

By the current prices of 1858 this valuation would be reduced to about \$39,000,000. The proportion of labor in the price of pig iron is estimated at 60 per cent., of rails and bar iron about 66 per cent., and in the smaller and finer descriptions of iron about 75 per cent. The returns of 1857, so far as collected, exhibit a falling off from 1856, and those of 1858, it is believed, will not present more than one half the production of 1857.—From the very voluminous literature of iron only a few of the most important and latest works need be referred to. Rinman the Swede in 1785 made the first references to the history of iron, published in his *Försök till jernets historie*, which Karsten afterward translated into German. This distinguished Prussian translator and author, in the successive editions of his *Handbuch der Eisenhütten Kunde* (of which the first appeared in 1816), and in the French

translations entitled *Métallurgie de fer*, has presented all of importance known relative to the processes of manufacture up to the dates of these editions. The chemists Berzelius, Berthier, and others, have furnished in their works much original instruction in the chemical treatment of the subject. Dufrenoy, Élie De Beaumont, Coste, and Peronnet, in their *Voyage Métallurgique en Angleterre* (1837-'9), furnished full descriptions of the various departments of the English manufacture. In 1839-'40 was published Scrivenor's "History of the Iron Trade." Mushet's papers on iron and steel were collected from Tilloch's "Philosophical Magazine," and published in 1 vol. in 1840. In 1841 appeared Walter R. Johnson's "Anthracite Iron," also a "Report on the Manufacture of Iron," made under authority of the state of Maryland, by J. H. Alexander, and the edition of 1844 contained Samuel Rogers's letters on iron making; in 1843, the *Traité théorique et pratique de la fabrication du fer* of B. Valérius; in 1846, the voluminous and able treatise of Flachet, Barrault, and Pétiot, entitled *Traité de la fabrication de la fonte et du fer*; in 1850, Overman's "Manufacture of Iron in all its various Branches," and in the same year the volume of statistics of the association of iron masters at Philadelphia; in 1851, the very valuable treatise of B. Valérius, entitled *Traité théorique et pratique de la fabrication de la fonte*; in 1855, "The Iron Manufacture of Great Britain, theoretically and practically considered," by Wm. Truran, C. E.; in 1859, "The Iron Manufacturer's Guide to the Furnaces, Forges, and Rolling Mills of the United States," by J. P. Lesley, secretary of the American iron association. See also Tredgold's "Essay on Cast Iron" (1824; with additions by Hodgkinson, 1842-'6); Turnbull "On Cast Iron" (1832). Many valuable essays upon iron are contained in the numbers of the *Annales de chimie et de physique*, *Journal des mines*, *Annales des mines*, and other scientific journals.

IRON MASK. See BASTILE.

IRON MOUNTAIN, a remarkable hill of specular iron ore situated on the S. E. border of Washington co., Mo., about 60 m. S. W. from St. Genevieve, the nearest point on the Mississippi river. The locality is connected with St. Louis by railroad. The hill belongs to a ridge of porphyritic and other igneous rocks, which ranges N. E. and S. W. along the E. side of Bellevue valley, and forms the S. W. termination of a spur of this ridge. In its natural condition it was an insignificant member of the group with which it is connected. Its average elevation above the valleys around is stated by Dr. Litton in the state geological report to be 288 feet, and the area it covers is about 500 acres. As seen by the writer in 1841, its shape was that of a low cone; its sides gently sloping, with no outcrop of rock or ore, and its surface covered with a forest of oak, the trees thriving in a soil which was wholly composed of fragments of peroxide of iron, comminuted and

* Not completed at the date of the returns.

coarse mixed together. On the E., S., and W. sides loose lumps of the iron ore were scattered about, and upon the summit were loose masses of ore weighing many tons each. Excavation of the ore was commenced in 1845 on the W. side of Little Iron mountain, a prolongation in this direction of the larger hill. An open cut, 15 feet deep, was made in loose ore of small rounded pieces closely packed together, with nothing intermixed excepting a little bright red ferruginous clay. At the bottom of the cut was a bed of red clay. The ore was almost pure peroxide, a little silica only being present. A small blast furnace was soon built close to the excavation, since which time two more have been added. The valleys are underlain with magnesian limestone in horizontal strata; this rock supplies the flux for the furnaces. Some distance, however, beyond the base of the mountain, the ore is traced by sinking in the valleys, and no evidence is afforded of its giving out in depth. An Artesian well has been sunk to the depth of 152 feet between two of the furnaces, and the last 50 feet of this was in iron ore. The beds passed through from the surface down were as follows: iron ore and clay, 16 feet; sandstone, 34 feet; magnesian limestone, $7\frac{1}{2}$ inches; gray sandstone, $7\frac{1}{2}$ inches; "hard blue rock," 37 feet; "pure iron ore," 5 feet; porphyritic rock, 7 feet; iron ore, 50 feet to the bottom. Dr. Litton concludes that "from surface indications, and from all explorations made, the whole Iron mountain seems to be a mass of iron ore." Whether this prove so, or other beds like those penetrated in the Artesian well below the base of the mountain and near its margin should be found interstratified with beds of ore, the quantity convenient to hand without mining may safely be regarded as inexhaustible. The ore, being almost absolutely pure peroxide, should contain within a fraction of 70 per cent. of iron; its yield of pig iron, however, is stated to be only 56 per cent. The fuel employed in 1854 was charcoal, of which about 160 bushels was consumed to the ton of 2,268 lbs. Each furnace then made an average yield of 6 tons a day, but one of them has since turned out 15 tons a day; the iron is chiefly No. 2 gray iron; and the total production up to the close of the year 1854 had been about 24,600 tons.—In the same vicinity are other hills also distinguished for the immense bodies of iron ore they contain. The most noted of these is the Pilot Knob, situated 6 m. S. of the Iron mountain, an isolated conical peak, covering an area of 360 acres, and rising very steeply to the height of 580 feet above its base, which is 537 feet above the level of the railroad at St. Louis. The rock ledges projecting from its precipitous sides are of slaty silicious character, of dark gray color, very hard, and inclined 25° or 30° toward the S. W. Toward the top the rock becomes ferruginous, and ledges and loose blocks of great size of pure iron ore and mixed ore and rock cover the surface. Some are conglomerates of quartz and ore, black or red, passing in one

direction into pure ore, in the other into quartz rock. At 440 feet above the base, where its horizontal section would give an area of about 53 acres, on the N. side, is an exposure of a bed of ore 273 feet in length, and varying from 19 to 24 feet in thickness, included in the slaty rocks and dipping with them. Other parallel beds are said to occur in the same formation lower down the hill. Above this exposure, where the ore is now quarried, other beds are seen interstratified with the silicious rock to the very summit; and here it rises in a rocky peak 60 feet high, forming a craggy knob, from which the mountain is named. The rough iron ledges are gray without and covered with moss. The ore has generally a more slaty structure than that of the Iron mountain, and a finer grain. Some specimens present a micaceous appearance. The foreign matters intermixed are silica and alumina, the former being found in all proportions, the latter up to about 3 per cent. The quantity of very pure peroxide conveniently available is incalculable. A blast furnace commenced operations here in Aug. 1846, and had produced 6,210 tons of pig metal up to Sept. 18, 1854. A second furnace was completed early in 1855. A bloomery with 6 fires was started in Oct. 1850, and had produced 3,000 tons of blooms up to Nov. 15, 1854. These were estimated to cost \$30 per ton, the production and reheating of one ton (2,464 lbs.) of blooms requiring the consumption of 367 bushels of charcoal. Some of the supplies of ore for these works are brought from Shepherd mountain, another of these extraordinary iron mountains, lying $1\frac{1}{2}$ m. S. W. from the Pilot Knob, and belonging with the latter to the Madison iron and mining company. It is a hill rising 660 feet above its base, which covers an area of 800 acres, composed of porphyritic rocks penetrated with veins or dikes of iron ore, which run in different directions. These ores are magnetic and specular, and are found in great purity.—These bodies of iron ore must eventually prove of immense importance to the western states, and will furnish unlimited supplies to blast furnaces scattered through the coal districts of those states, to which transportation is facilitated by railroads and navigable rivers. The ores will be largely used for the manufacture of steel, which at the present time is more cheaply furnished from abroad.

IROQUOIS, a group of American Indians, originally embracing 5 and afterward 8 nations, who planted themselves in western New York and on the shores of Lakes Ontario and Erie, where they were surrounded by the Algonquin-Lenape. These nations were the Mohawks, Oneidas, Onondagas, Cayugas, and Senecas, to whom the Tuscaroras were added as a 6th nation in 1722; in 1723 the Huron tribes were received, and as an 8th nation the Algonquin Mississaguas from Canada; these were collectively called Mingoes by the English. The Iroquois confederacy was the most permanent and powerful of the savage governments found in North America. Seeing the other tribes destroy-

ing themselves by internal discords, the Iroquois formed themselves into a confederacy in which the principles of military glory and tribal union were carried to the highest Indian perfection. They pursued war and hunting, but returned to their fixed villages, where their families followed agricultural pursuits. In the Iroquois nations we see the action of the principles afterward embodied in the constitution of the United States. Each canton or tribe was independent, and each was bound to the others of the confederacy by ties of general interest and honor, very much in the same manner as the United States of America are held together; each had a voice in the general councils, and possessed a kind of veto power. Matters of common interest were decided in a general meeting of the sachems of all the nations, commonly held at Onondaga. They followed the maxim, used by the ancient Romans, of encouraging other nations to incorporate with them, and adopted captive people into their confederacy; in this way their strength became such that in the early part of the 17th century they had conquered all the neighboring tribes, and doubtless in a hundred years, had the whites not colonized America, would have absorbed all the nations from Canada to the gulf of Mexico. Their sachems were constituted by the general voice admitting their courage and wisdom; they lived in a true Roman simplicity, accepting no salary, disregarding profit, and giving away their share of the plunder of war or the perquisites of peace; they despised every unworthy action, and thought themselves fully rewarded by the love and respect of the people. Feeling themselves by nature and by their political system superior to other nations, they possessed a courage which made them the terror of other tribes; the time has been when a single Mohawk was enough to put to flight a hundred of the New England Indians, and when an old chief, in the poorest costume, issued his orders to tributary nations with the unquestioned authority of a Roman dictator. As among all brave nations, woman was more respected among the Iroquois than in any other Indian tribes; the Iroquois matrons possessed a conservative power in the state, being represented in the public councils, and exercising a veto influence in the declaration of peace and war; this was certainly very remarkable in a government founded on military principles. Slavery was unknown among them. As in other republican governments, where no single person has power to compel, the arts of persuasion were highly cultivated; the Iroquois were celebrated for their eloquence; in proof of this we need only mention the Cayuga Logan, the Seneca Red Jacket, the Oneida Skennandoah, and the Onondaga Garangula; the famous Brandt was a half-breed Mohawk. The tradition of Hiawatha (a person of very great wisdom), who advised the union of the "Five Nations" at the Onondaga council fire, is given in Schoolcraft's "History of the Indian Tribes," vol. iii. During the war of the revolution the

Iroquois took the part of Great Britain, and severely annoyed the frontier settlements of New York and New Jersey. A powerful expedition was sent against these in 1779 under command of Gen. Sullivan, and their country was ravaged and 18 of their villages burned. This movement effectually broke their power, though their incursions did not immediately cease. After the war treaties were made with them in 1784, and again in 1789, by which extensive cessions of land were made to the United States, on consideration of an annual payment in goods to the value of \$3,000. By subsequent treaties further cessions were made, until in 1796 the Indian title had been extinguished to the whole region between Lake Champlain and the St. Lawrence. In the war of 1812 their few remaining warriors assisted the Americans against the British, and were organized for military service under the command of Gen. Porter. Repeated cessions of land to the whites have reduced their territory from the dimensions of an empire to that of a plantation. The Iroquois group, scattered in New York, Wisconsin, Arkansas, and Missouri, in 1855 contained about 6,000 souls, cultivating 30,000 acres of land, with an estimated annual product therefrom of the value of \$83,000; they numbered about 1,000 warriors, and received \$40,000 annuity in money and goods.

IROQUOIS, an E. co. of Ill., bordering on Indiana, and drained by Kankakee river; area, 750 sq. m.; pop. in 1855, 6,788. It has a level surface, much of which is occupied by prairies, and the soil is generally fertile. The productions in 1850 were 311,115 bushels of Indian corn, 27,125 of wheat, 69,793 of oats, 18,763 lbs. of wool, and 1,496 tons of hay. The county is traversed by the Chicago branch of the Illinois central railroad. Capital, Middleport.

IRRAWADDY, IRAWADI, or AIRAVATI ("great river," or "elephantine river"), the principal stream in India E. of the Brahmapootra. It rises in Thibet at the E. extremity of the Snowy range of the Himalaya, in lat. 28° 5' N., long. 97° 58' E., flows S. across the territory of Burmah, which it divides into two nearly equal parts, and traverses the British district of Pegu, entering the bay of Bengal by several mouths which form an extensive delta. Its whole length is 1,060 m. It separates 140 m. below the S. frontier of Burmah into two branches, the eastern of which is named the Rangoon or Siriam from the principal cities on its banks, and falls into the gulf of Martaban, while the western, called the Bassein, enters the bay of Bengal near Cape Negrais. The delta is formed by offsets from both these branches. The Irrawaddy has two striking deviations from its general southerly course: one just below the mouth of the Taping, about lat. 24° 15' N., where it makes a bold curve in the shape of the letter S, and the other at Amarapoora, the former capital of Burmah, where it turns sharply to the W., and, after receiving the waters of its largest tributary, the

Khyen-Dwem, flows successively S., S.W., and again S. The most important of its other affluents are the Nam Boom, Shwe-lee, Myitnge on the left, and the Mogouny, Moo, Yo, and Matoong on the right. The principal cities and towns on its banks are Bhamo (a trading town having a considerable traffic with China), Amarapoora, Ava, Pagan, Maloon, Prome, Bassein, and Rangoon. Mandalay, the new capital of Burmah, is situated about 4 miles from the river. From above the junction of the Khyen-Dwem to Maloon the Irrawaddy spreads itself over a channel reaching sometimes to a width of 4 or 5 miles. It is then restricted between steep and hilly banks, and does not expand again considerably until it has passed Prome. It is navigable to Ava at all seasons by boats drawing 3 feet of water, and during the rains vessels of 200 tons can ascend to the Mogouny, a distance of 800 m. from the sea. Klaproth and the Chinese geographers consider the Irrawaddy a continuation of the Sanpoo of Thibet; but the latter river is now generally admitted, though not positively ascertained, to be identical with the Brahmapootra.

IRRIGATION, the watering of lands by currents led through numerous channels distributed over the surface; also by temporarily flooding them with water. The art is considered one of the most ancient applications of science to agriculture. It was practised from time immemorial by the ancient Egyptians and by the Assyrians and Babylonians, and has ever continued of prime necessity in the warm countries bordering the Mediterranean. The plains of Assyria and Babylonia were covered with an immense system of canals, some of them hundreds of miles in length, intended partly for navigation and partly for irrigation. Their remains to this day constitute one of the most prominent features in the antiquities of those countries. The Assyrians used machines for raising water from the rivers, or from the canals when it could not be led into the fields through common conduits. They were generally obliged to have recourse to this artificial mode of irrigation, as the banks of the rivers and consequently those of the canals were high above the level of the water, except during the spring, when they were swollen by violent rains or by the melting of the snow on the mountains of Armenia. Their mode of raising water was probably the same as that practised by the present inhabitants on the banks of the Tigris and Euphrates. In the first place a high bank, which is never completely deserted by the river, must be chosen. A broad recess down to the water's edge is then cut in it. Above, on the edge of this recess, are fixed 3 or 4 upright poles, according to the number of oxen to be employed, united at the top by rollers running on a swivel, and supported by a large framework of boughs and grass, extending to some distance behind, and intended as a shelter from the sun during the hot days of summer. Over each roller are passed two ropes, the one

being fastened to the mouth, and the other to the opposite end of a sack, formed out of an entire bullock skin. These ropes are attached to oxen, who throw all their weight upon them by descending an inclined plane cut into the ground behind the apparatus. A trough formed of wood and lined with bitumen, or a shallow trench coated with matting, is constructed at the bottom of the poles, and leads to the canal running into the field. When the sack is drawn up to the roller, the ox turns round at the bottom of the inclined plane, and the rope attached to the lower part of the bucket being fastened to the back part of the animal, he raises the bottom of the sack, in turning, to the level of the roller, and the contents are poured into the troughs. As the ox ascends the bucket is lowered; and, when filled by being immersed into the stream, is again raised and emptied as above described. This mode of irrigation is very troublesome, and requires the constant labor of several men and animals; but it is generally adopted on the banks of the Tigris and Euphrates, and in this way, says Mr. Layard, all the gardens of Bagdad and Bassorah are watered. The annual overflows of the Nile no doubt taught the Egyptians the benefit to be derived from flooding their lands, and led them early to construct the artificial lakes that served as reservoirs, and the system of canals that enabled them to command supplies of water whenever required, the ruins of which are still to be seen among the wonderful monuments of the skill and industry of this ancient people. The reservoirs were filled either by the overflowing of the Nile, or by raising its waters by the simple machines they employed. The chief of these appears to have been the *shadoof* or bucket suspended from one end of a long balanced pole. They also conveyed the water in buckets, slung upon a pole which they carried across their shoulders. The water wheels moved by oxen, now in use in that country, called the *sakiyeh* and the *taboot*, are of modern introduction, and so probably is the hydraulic screw of Archimedes, according to Wilkinson; who adds: "They may also have had the foot machine mentioned by Philo; and it is either to this, or to their stopping the small channels which conducted the water from one bed to another, that the sentence in Deuteronomy (xi. 10) refers." This is one of several beautiful passages in the Old Testament making mention of the benefits derived from abundant supplies of water, and in it Moses clearly sets forth the difference between the artificial irrigation of Egypt and the natural watering of the promised land: "For the land whither thou goest in to possess it, is not as the land of Egypt, from whence ye came out, where thou sowedst thy seed, and waterdest it with thy foot, as a garden of herbs; but the land whither ye go to possess it, is a land of hills and valleys, and drinketh water of the rain of heaven." At the present time the water is raised from the Nile by means of the so called Persian wheels, which are seen along the banks of the river from the

sea to the cataracts. It is received into large cisterns, and is let out as required, being conducted along the channels prepared through the fields of grain, melons, sugar cane, or saffron. Similar methods are in use in the hot countries of other parts of Africa and of Asia. The rice crops especially require the most thorough irrigation, which is effected by keeping the surface under water at several different periods of their growth. This practice is adopted also in the southern United States. In the agriculture of Italy, France, and Spain, irrigation is now an important feature, as it was in the time of the ancient Romans. From Venice to Turin the country is like one great meadow. The water is carried not only over the grass lands and the rice fields, but between the ridges in the grain fields and through the vineyards round the roots of the vines. The distribution of it is controlled by a regular system. The state itself claims the waters of all the rivers of Lombardy; and in the Venetian territories all the springs and collections of rain water belong to the government. The use of the waters of the rivers is rented out at a certain price by the hour or half hour, or for so many days at certain seasons of the year. Persons are entitled to make canals through the lands of others lying between them and the river, on paying for the damage thus caused. The channels for leading the water into the lands and the parallel channels alternating with them, placed at about 6 inches lower elevation for conveying the water away, are laid out with great regularity at distances usually of about 22 feet between them. In the summer the water is allowed to flow through them for several hours* about once a week, and in winter the flow is kept up from October to April except at the time of cutting the grass. In northern Italy lands that can be irrigated rent for $\frac{1}{4}$ more than the same class of lands not thus improved. In the article DAM mention is made of the highest structure of this class probably ever made, which was built in Spain in the 16th century to provide a reservoir for the waters used in irrigating the vineyards, which purpose it has continued ever since to serve. Upon the American continent, the ancient inhabitants of Peru were found by their Spanish conquerors in the use of the most costly works constructed for irrigating their lands. Prescott remarks: "Canals and aqueducts were seen crossing the low lands in all directions, and spreading over the country like a vast network, diffusing fertility and beauty around them." In the article AQUEDUCT, the wonderful magnitude of some of these works has been already noticed. The Aztecs of Mexico also made use of similar means to counteract the natural dryness of their atmosphere; and in the beautiful gardens of Iztapalapan, watered by canals and aqueducts, and moistened by the spray of fountains, was exhibited to the astonished Spaniards a perfection of horticulture at that time unknown in Europe.—Irrigation upon a large scale and by

the Italian method was attempted in England in the 16th century on the estate of Babraham in Cambridgeshire; but the system was not fairly established as an important branch of agriculture until the commencement of the present century. Of late years what are called water meadows have become a common feature in some of the best cultivated counties, especially in Wiltshire, Devon, Somerset, and Gloucestershire, and also in the southern part of Scotland. Some peculiar methods have been introduced, as that of irrigating with currents of liquid manure; and the sewerage of Edinburgh is distributed on the same principle with the most beneficial results over the meadows that lie below the level of the city. The grass grown upon the meadows thus watered has to be cut about once every month from April to November, and it is described as of remarkably tender and succulent quality, admirably adapted as a milk-producing food for cows. With some exceptions the general practice is not to leave the water standing upon the lands; but taking it from a running stream (which should be tapped if practicable far enough above the meadow for the water to flow in from the bottom of the current, where it is most charged with sediment), it is conveyed in a main channel around the further margin of the meadow, and numerous side branches lead off in nearly parallel lines into its central portions, each tapering to a point. These are commonly interlocked by others proceeding in the opposite direction from the main channel, on the lower side of its circuit, as it passes back to the river. The second set, being at a lower level than the first, serve as drains, conveying the water that overflows from the first to the main channel, which in the latter part of its course is no longer a feeder but a drain. The water is allowed to flow through this system as often as may be desirable, care being taken that it shall not lie at rest at any time, the effect of which is found to be a tendency to cause the growth of a coarse grass. This method is called bed-work irrigation, from the ground being laid out in nearly regular beds by the channels. It is applicable only to tolerably level land. By another method, called catch work, irrigation is conveniently applied to uneven ground. One set of channels follow the contour lines of the ground, each retaining its own level. These are crossed nearly at right angles by numerous other small channels, which are fed at their upper ends by the main gutter, and the water flowing down is directed by stops of clods of earth into the level side channels, which are filled as may be desired. The laying out of the work and management of the operation, so as to distribute the water uniformly, in the proper quantities, and at the right times, require good judgment, close attention, and much experience. The irrigating season in England is the colder portion of the year, commencing in October or November, and terminating in March or April. The letting the water on or off during

frosty weather is to be avoided, as a crust of ice may root out the grass as it thaws. As nearly as may be, with reference to this danger, the water is allowed to flow through the channels for 2 to 3 weeks at a time, and is then drawn completely off, so that the ground may become as thoroughly dry as possible. In this condition it is left for 5 or 6 days, when if there is no fear of freezing the operation is repeated; and so on through the winter. When the grass begins to vegetate, the periods of irrigation should be shortened, and cease entirely when it is sufficiently forward to make good pasture. The effect of this practice upon sheep farms is often very striking. The grass is brought forward very early in the spring, giving fresh pasture to the ewes and lambs sooner than could be otherwise obtained, sooner indeed than the upland meadows have begun to vegetate. After feeding off one crop or mowing the grass, the land is sometimes again irrigated for a short time to great advantage. The warmer the air, the less time will the grass bear to be covered. A second crop is ready to be cut by the time the first has ripened on the dry meadows. "Thus by judicious management," it is affirmed, "3 or 4 crops of grass are obtained in each season, or only one abundant crop is made into hay, and the sheep and cattle feed off the others." By this means alone common pasture has been converted into the best of mowing.—But the perfection of irrigation is when it is combined with thorough under draining. There is then a healthy system of circulation going on. The water flowing in brings with it in solution and suspension various mineral and organic substances suitable for the food of plants. By evaporation and by various chemical reactions the soluble ingredients may be set free, when they become entangled with the other foreign matters in the grass and in the soil beneath, both of which act as filters. Thus the finely comminuted sediments and the soluble salts are equally distributed among the rootlets, and these are refreshed by the new supplies furnished by each repetition of the process. By the drains the excess of moisture is soon removed, stagnation, so injurious to vegetation, is prevented, and the elements that feed the plants below the surface are kept in a similar condition of healthy renewal with those of the air circulating among the branches, and adding to the vegetable growth by assimilation going on through the leaves. The benefits derived from the process vary of course with the quality of the ingredients brought in by the water, according as these are more or less suited to the requirements of the soil and of the crop. The hard water, charged with carbonate of lime, which it has gathered in flowing through a limestone region, brings a valuable fertilizing ingredient to silicious soils deficient in lime; and the clayey sediment washed out of alluvial bottoms is spread with the most beneficial effect over loose sandy soils. Where lime is already in excess, so that the soil effervesces with acids, water charged with the acid salts of iron may

be introduced to advantage, which, reacting upon the carbonate of lime, may produce in the soil the fertilizing gypsum. Organic bodies held in solution give to the waters the qualities of liquid manures, and the nature of these should be understood that other applications may be made with due reference to their composition. Pure water alone is highly serviceable, acting like the rain to carry along with it to the rootlets the elements of vegetable growth which it takes up in the soil, beside entering itself into the circulation of the plants. In some situations, where the ground is nearly level and provided with under drains, it is found advantageous to use these as a means of irrigation. This is done by causing the water to back up through them with sufficient head to pass up to the surface. It is soon drawn down again, the chief effect being to thoroughly moisten the soil. The operation is most beneficial in times of drought, and is practised to advantage in the summer either for arable or pasture land.—A system of irrigation, called warping, is practised in favorable situations in England, such as along the estuaries of rivers, where the lands are low and the tides have a great rise and fall, and the rivers bring down large quantities of sediment. By means of sluices and gates the water with the rise of the tide is allowed to flow through the embankments, and is conveyed by channels to any desired points, sometimes several miles distant, and is then let out over the surface. This method is most successfully conducted on the estuary of the Humber, the same region which was the scene of the operations referred to in the article DRAINAGE. The sediment brought down the rivers Trent, Ouse, and Don is a rich calcareous mud mixed with sand derived from the chalk formation and the diluvial soil of the upper districts. In a very dry summer the water is most highly charged with the sediment, and by letting it on the land with the flood tides, and draining it off with the ebb, a new soil accumulates of the most fertile character, sometimes amounting to 3 feet and usually to more than one foot in thickness in a single season. In the winter and during floods the operation is suspended.—Meadow lands are often kept flooded with water in the northern part of the United States during the winter season, with the view of hastening the growth of the grass in the spring. The covering of ice protects the surface of the ground from excessive cold, and many of the plants continue to thrive beneath the water. By remaining long, however, the coarser varieties are nourished at the expense of the finer grasses; and unless the water is thoroughly drained off in the spring its stagnation in pools is likely to do more injury than the good accruing from the practice can compensate for.

IRVINE, WILLIAM, a brigadier-general in the American army during the war of the revolution, born near Enniskillen, Ireland, about 1742, died in Philadelphia, July 30, 1804. Having graduated at Dublin university, he studied

medicine and surgery, and was appointed surgeon on board a ship of war, serving during a part of the war of 1756-'63 between Great Britain and France. On the declaration of peace he emigrated to America, and in 1764 fixed himself in Carlisle, Penn., where for 10 years he practised his profession. At the opening of the revolution he took part with the colonies. He was a member of the provincial convention assembled July 15, 1774, until he was appointed by congress, Jan. 10, 1776, colonel of the 6th battalion of the Pennsylvania line, and was ordered to join the army in Canada. He was made prisoner at the battle of Trois Rivières in June of the same year, and was taken to Quebec, but was released on parole, Aug. 3. Proceeding home, he made great exertions to be exchanged, but this was not effected until April, 1778. He then joined the army, and on May 12 resumed command of his regiment. In July, 1779, he was a member of the court martial which tried Gen. Charles Lee. On May 12, 1779, he was promoted to the rank of brigadier-general, and was assigned to the command of the 2d brigade of the Pennsylvania line. He was selected as one of the members of a court martial to try Gen. Arnold, but was objected to by that officer. In the unsuccessful attack of Gen. Wayne at Bull's Ferry, July 21 and 22, 1780, he commanded his brigade. In the autumn of 1781 he was ordered to Fort Pitt, to take command of the troops on the western frontier. He continued to fulfil the arduous duties of his post until Oct. 1, 1783, after the war had closed. At the request of the Pennsylvania troops he was early in 1785 appointed by the state agent under an "act for directing the mode of distributing the donation lands promised to the troops of the commonwealth." About this time he suggested to Pennsylvania the purchase from the United States of the tract of land known as "the triangle," thus giving to the state an outlet upon Lake Erie. In 1787 he took his seat as a member of congress under the confederation, and was selected by that body, with Messrs. Gilman and Kain, one of the commissioners for settling the accounts of the United States with the several states. He was subsequently a member of the convention for revising the constitution of Pennsylvania. He was again from 1793 to 1795 a member of congress. In 1794 he was assigned to the command of the Pennsylvania troops for the purpose of quelling the "whiskey insurrection," and in all the most important movements in connection with this subject he took an active part. Being appointed by President Jefferson, in March, 1801, superintendent of military stores at Philadelphia, he removed to that city, where for the few remaining years of his life he was occupied with the active duties of this office. He was president of the state society of the Cincinnati at the time of his death.—He had two brothers who were gallant officers in the war of the revolution: Capt. Andrew Irvine of Wayne's brigade,

wounded at Paoli; and Dr. Matthew Irvine of Lee's famous legion, wounded at the head of Armstrong's cavalry in his memorable charge on the 19th regiment of the British army at Quimby. Three sons of Gen. Irvine were also officers of the army of the United States: Gen. Callender Irvine, commissary-general of purchases; Col. William N. Irvine, of the 42d infantry; and Capt. Armstrong Irvine, 4th rifle regiment, distinguished at the battle of Chrysler's Field, Nov. 11, 1813, and at Lyon's creek, Oct. 19, 1814.

IRVING, EDWARD, a Scottish preacher and divine, born in Annan, Dumfriesshire, Aug. 15, 1792, died in Glasgow, Dec. 8, 1834. His father was a tanner, and apparently a man of some substance. Edward was sent to the university of Edinburgh, where he so excelled in mathematics that in his 19th year he was appointed, on the recommendation of Prof. Leslie, mathematical teacher in an academy at Haddington. In 1812 he was made rector of an academy at Kirkcaldy. Here he remained 7 years, pursuing at the same time the studies required of a candidate for the ministry of the church of Scotland. His favorite reading was the works of the standard authors of English literature in philosophy and theology, Bacon, Hooker, and Jeremy Taylor. It was by familiarity with such writers that his mind acquired that fulness and his style that stately majesty which distinguished him in after years. He had an extended acquaintance with modern languages and literature, as well as more than ordinary acquirements in natural philosophy. Having completed his course of probation, he was ordained by the presbytery of Annan, but for some years he received no invitation to settle as a pastor, and had no presentation to a living. In the spring of 1819 he left Kirkcaldy, and preached for a while at various churches. Dr. Chalmers heard him at Edinburgh, and proposed to him to become his assistant in Glasgow. To this he acceded, and continued in that office three years, when he resigned it and took charge of the Caledonian church, Hatton Garden, London, a small remnant of a congregation in connection with the church of Scotland. He entered upon this ministry in 1822. Within a few months of his settlement there, his preaching had created an unprecedented sensation. Crowds pressed to his weekly services. The nobility, members of parliament, judges, and barristers of every degree, physicians, clergymen, dissenters, duchesses, noted beauties, besieged the doors and were crowded together in the passages, attracted no less by the eloquence and power than by the plain-spoken originality of the preacher. Irving had long been impressed with the conviction that the whole of Christendom had fallen away from its perfect standard; and the aim of all his ministry was to bring the church back to something like its normal condition, as a spiritual organization. This desire gave shape and form to his labors both in the pulpit and with the pen. With a view to break up the routine habit of

mind, which he conceived destroyed the effect of preaching generally, he adopted a style of discourse different from the usual form of sermon, which he called "orations." A series of these, entitled "Orations for the Oracles of God," which were preached in 1823, he published in the same year in a volume with another series entitled "An Argument for Judgment to Come, in 9 Parts." This was the first of his published writings. For brilliant rhetoric, close logic, and stirring appeal to the heart and conscience, these discourses—in many respects as regards style very faulty—are unsurpassed by any thing in English homiletic literature. The next year he was called upon to deliver a missionary discourse, the sentiments of which, following out his leading thought, were so contrary to the views of the society for which he preached, the London missionary society, as to occasion much dissatisfaction. This discourse was published about a year after its delivery, much enlarged, under the title: "For Missionaries after the Apostolic School, a Series of Orations, in 4 Parts. Part I., the Doctrine." This publication was prefaced by a dedicatory epistle to Coleridge, in which he recognizes with thankfulness the great benefit he had derived from his intercourse with that remarkable man. The other 3 parts of this series never appeared. This oration was perhaps the first distinct unfolding of his future career. In 1825 he delivered a course of lectures, afterward published, entitled "Babylon and Infidelity Foredoomed." On Christmas day of the same year he first began to make known the convictions to which he had attained in relation to the second and personal advent of the Lord Jesus Christ, and the nearness of that great event. In course of the next year (1826) he fell in with a Spanish work entitled "The Coming of Messiah in Majesty and Glory, by Juan Josafat Ben Ezra," which, though purporting to be written by a Christian Jew, was in reality the work of Lacunza, a South American Jesuit, who lived in the last century, and assumed this *nom de plume* to avoid the censures of the church. Of this work he undertook the translation in company with Mrs. Irving, learning Spanish for the purpose, and devoting to it a period of relaxation from his duties in London, which he had taken at the request of his flock. To this translation he prefixed an introduction, which is regarded as one of his best works, in which he assigns as his reason for undertaking the translation, the coincidence he discovered in the work with the convictions concerning the second advent which he himself had attained. The book appeared in 1827. About the same time his attention was called by the death of one of his children to the subject of infant baptism, which resulted in a series of "Homilies on the Sacraments" (12mo., 1828). From this he was led to enter more fully into the great doctrine of the incarnation, to the exposition of which he devoted much labor, both in preaching and in controversial writings; affirming the perfect oneness of Christ with us in all

the attributes of manhood, including its infirmities and liability to temptation. On this account he was charged with asserting the sinfulness of Christ's human nature, and upon this charge finally deposed from the ministry by the presbytery in Scotland. It needs but a slight inspection of his works to see the groundlessness of this charge. What he did teach was that Jesus Christ took from his mother human nature, such as it was in Adam after the fall, though in him without actual sin. It is claimed, not without some apparent ground, that his teaching on this subject was the origin of a revival of a similar strain of teaching in a portion of the English church. All this time the interest in the study of prophecy was kept alive by Irving and his friends, and took a practical form in a series of conferences of those interested, which were held at Albury Park, in Surrey, under the patronage of Henry Drummond, Esq., and by the publication of a quarterly periodical entitled the "Morning Watch," to which Irving was a copious contributor. In the spring of 1830 reports came to London of some remarkable phenomena in the neighborhood of Port Glasgow in Scotland, consisting in what appeared to be supernatural utterances, *i. e.*, words spoken under the impulse of a supernatural power partly in the vernacular and partly in forms of language that were not known. When this report was received, the persons associated with Mr. Irving in the study of prophecy, and in the hope of the second coming of Christ, deemed it proper to investigate the matter. Accordingly, a deputation was sent to inquire into the nature of these phenomena. After a careful scrutiny these persons were satisfied that here was in reality a revival of the "spiritual gifts" common in the first ages of the church, and specially referred to in St. Paul's epistle to the Corinthians. Soon after the same phenomena appeared in London, not only in Mr. Irving's congregation, but also in a dissenting congregation and in one or more of the churches of the establishment. Irving was the only minister in a position to recognize and encourage these manifestations, which soon became very abundant in his congregation, and which he regulated to the best of his ability. A full account of these "spiritual gifts" was given by Irving himself in "Fraser's Magazine" in 1830. An unavoidable consequence of this course on his part was the loss of his great popularity, and, although the majority sided with him, an opposition in his own congregation. This opposition resulted finally (in 1832) in his expulsion by the trustees from the building which had been erected for his use, after a hearing before the London presbytery—a semi-ecclesiastical body, who were by the trust deed under which the building was held appointed arbiters in disputed questions. Following this he was in the next year (in March, 1833) arraigned before the presbytery of Annan in Scotland upon a charge of heresy and irregularity, and deposed. His defences on both these occasions are among his

most distinguished oratorical efforts. The portion of the congregation that adhered to him became of necessity a distinct community. As such they retained at first the Presbyterian order of worship and constitution of membership. But this was early modified through the agency of the prophetic utterances which abounded among them. Attention was directed to the restoration of apostles and prophets as the most fundamental constituent of the church; and some time in the year 1832, at a meeting for prayer held in a private house, it is asserted, one of those present was declared in the word of prophecy to be an apostle, and exhorted to the exercise of his office, in conveying "the Holy Ghost by the laying on of hands." When Mr. Irving had been deposed in Scotland he ceased, in obedience to what he believed to be a spiritual utterance, from administering the sacraments and fulfilling priestly functions, confining himself to the work of a preacher or deacon until he should receive a new ordination from the Spirit. On April 5, 1833, he believed that this supernatural ordination was conferred, when he was by the hands of the apostle constituted "angel," or chief pastor or bishop of the church, which was then worshipping in a large room in Newman street, formerly Benjamin West's picture gallery. Wilks says ("Life of Edward Irving," London, 1854): "It seems to be generally supposed that Irving appointed the apostles, not that he was appointed by them." That he held a prominent position in reference to the movement is manifest, but the form which it took was not the result of any plan or theory of his, nor was it fully and finally developed until some years after his death. Not long after these events his health failed. In the autumn of 1834 he set out, in obedience as he supposed to the word of the Holy Spirit, on a journey to Scotland, where he died. His personal characteristics were striking. He was at least 6 feet high; his limbs were well proportioned; black hair clustered in profusion over his lofty forehead, and descended in curls upon his massive shoulders; his eyes were dark and piercing, though affected by a squint; on his lips there sat the firmness of a ruler and trembled the sensibility of a poet. He was always neat and elegant in his dress; he had none of the over-righteous temper of the Pharisee; he associated and lived in the world without restraint, joining in the forms and fashions of a mixed society, and was remarkable at the same time for blamelessness of life. His morals were untainted, his conscientiousness exact. A collection of his "Sermons, Lectures, and Occasional Discourses" was published in 1828 (3 vols. 8vo., London).—The church in Newman street became the centre of a widely extended community, which began very rapidly to spread throughout the British isles. In course of the next two years after Irving's death additional persons were called to be apostles, until the number of twelve had been completed, when they were as a whole set apart, or separated to the work to which

they had been called, and gradually the organization of the church was perfected. At the present time (1860) the body includes several congregations in Germany and Switzerland, also in France, Canada, and the United States, although in these last named countries the believers are not numerous. Statistics cannot be obtained. The constitution claims to be the perfect development of that which was established in the beginning of the Christian church. Its characteristic feature is the fourfold ministry of "apostles, prophets, evangelists, and pastors and teachers," referred to by St. Paul in the 4th chapter of his Epistle to the Ephesians. Within this fourfold classification are comprehended the three orders of the church catholic, bishops, priests, and deacons. The collective apostolate is the head of the episcopate, and holds the relation of centre of unity to the whole church. The body declines any name but that of the "Catholic Apostolic church," holding this not exclusively of all other churches, but as the only name by which the church should consent to be known. The church disclaims all sectarian aims. It assumes this to be the work of the Holy Spirit for the blessing of the entire Christian church throughout the world. It does not seek to proselyte, but is content with bearing a witness to the truth and strengthening all who are desiring to maintain the truth. It recognizes all the baptized as members of the one church, and each several Christian community according to the measure of the truth it holds. The whole system of teaching, worship, and discipline is based upon the doctrine of the incarnation, or the true and real manhood of the Lord Jesus Christ, and its application to man by means of sacraments and ordinances. Jesus is the Lord, and all ministries on earth are but forms by which his presence is made effective in the church. The worship is conducted by means of a ritual which embodies portions of the rituals in use in all different sections of the church, Greek, Roman, and Protestant. It makes use of material emblems and signs as far as they are significant of spiritual truths. Architecture, music, and painting, vestments of divers colors, incense, lights, all are employed to minister through the senses what is conveyed to the intellect and the spirit by words. When the numbers and means admit, the worship is conducted with all the magnificence that its importance justifies, while it is also capable of adaptation to very narrow circumstances. The eucharist is celebrated every Lord's day. Daily morning and evening worship is maintained. All the members pay tithes of their increase, which are applied to the support of the priesthood, beside offerings for other purposes. The great object of interest to all the believers is the hope of the speedy coming of the Lord Jesus Christ, when the dead in Christ shall be raised, and they who are looking for him shall undergo the change of their bodies which is spoken of by St. Paul in 1 Cor. xv. Mr. Irving's works throw but little light on the principles

of the church as such. Some of the works relating to it are: "The Liturgy and other Divine Offices of the Church;" "Readings on the Liturgy" (1 vol. and 2 parts of another, London, 1851); "Chronicle of Certain Events which have taken place in the Church of Christ, principally in England, between the Years 1826 and 1852" (London, 1852); "Defence of John Canfield Sterling, Presbyterian," &c. (New York, 1852); "A Letter from David Morris Fackler to the Right Rev. G. W. Doane, Bishop of New Jersey" (New York, 1852); "The Permanency of the Apostolic Office as distinct from that of Bishops, with Reasons for believing that it is now revived in the Church, by a Presbyterian of the Protestant Episcopal Church" (New York, 1852); "The True Constitution of the Church and its Restoration," by the Rev. William Watson Andrews (New York, 1854); "The True Apostolic Succession, a Letter to Rev. Francis Vinton," by John S. Davenport (New York, 1858).

IRVING, WASHINGTON, an American author, born in New York, April 3, 1783, died at his residence, Sunnyside, near Tarrytown, N. Y., Nov. 28, 1859. He was the youngest son of William Irving, a descendant of the Erwyns or Irvines of Orkney, who flourished there in the 15th century. His mother was an English woman. At the time of his birth his parents had resided in America about 20 years. Irving had an ordinary school education, which terminated in his 16th year. His elder brothers had occupied themselves with literary pursuits; and the family proclivity soon betrayed itself in the youth. He procured a number of the old English authors, and read with delight the poems of Chaucer and Spenser. The gay humor of the one, and the rich imagination of the other, served to cultivate the faculties from whose combination in his own works Irving was destined to derive so much fame. Other habits and pursuits of his early years tended strongly to mould his character and tastes. The scenes amid which he passed his boyhood were peculiar; they exerted a powerful influence upon the bent of his genius, and the choice of subjects for his writings afterward. New York was then a mere village in comparison with its present size; it scarcely contained 50,000 souls, and the great majority of the inhabitants lived below Cortlandt street and Maiden lane. The streets, studded everywhere with Lombardy poplars, had extended but a short distance above the park; and the rear portion of the new city hall was built of red stone, from the slight probability of its attracting much attention from the scattered inhabitants residing above Chambers street. Neither the appearance of the town nor its social character had lost the peculiarities of its origin. Its habits and manners were quaint and picturesque; many curious personages of local celebrity gave attraction to the population; and the strong Dutch infusion impressed upon the town a distinct individuality which has now in large measure dis-

appeared. In this old New York, full of character, oddity, and interest, passed the boyhood of Washington Irving. In the pleasant "Author's Account of Himself," prefixed to the "Sketch Book," he presents an entertaining picture of his school days, embracing many particulars which are valuable aids to the biographer. The paper bears every mark of an actual transcript of the habits of his youth, and of the influences which operated upon the development of his character. From his early years, he declares, he was always fond of visiting new scenes, and observing strange characters and manners. Even when a mere child he made tours of discovery into the foreign parts and unknown regions of his native city, to the frequent alarm of his parents and the emolument of the town crier. As he grew into boyhood, these travels were extended further. His holiday afternoons were spent in rambles about the surrounding country, by which means he soon grew perfectly familiar with every spot famous in history or fable, where a murder or a robbery had been committed, or a ghost encountered. On visits to the neighboring villages he added to his stock of knowledge by noting their habits and customs, and conversing with their sages and great men. This rambling propensity, so far from decreasing, strengthened as he advanced in years. Books of voyages and travels became his passion, and for their fascinating pages he avoided the duller pursuits of the school room. He would wander wistfully about the pierheads of his native town, and watch the white sails of departing ships, longing to float away in them to the ends of the earth. The strait of Hellgate, he declares in the introduction to the "Money Diggers," was a place of great awe and perilous enterprise to him in his boyhood, when he was "much of a navigator on those small seas," and more than once, in holiday voyages, ran the risk of shipwreck and drowning. The curious student of the peculiarities of Irving's genius will not fail to discover in these early habits and tastes the germ of many of his subsequent works. They doubtless occasioned in him a great fondness for the past of his native place, and stored his memory with local colors and incidents which were afterward to appear in the "Knickerbocker" history. Leaving school at the age of 16, he commenced the study of law. But the inclinations of the youth were all in the direction of a literary life. In 1802, at the age of 19, he began his career by writing for the "Morning Chronicle" newspaper, then edited by his brother Dr. Peter Irving, a series of papers upon the theatres, manners, and local events of the town, over the signature of "Jonathan Oldstyle." A pamphlet edition of these was published in 1824 without the sanction of the author, who seems to have regarded them as unworthy of collection. In 1804, the symptoms of a pulmonary affection having developed themselves, Irving sought relief in a sea voyage and a visit to the summer climate of the south of Europe. To this he was doubtless impelled

in a large degree by that inborn love for travel which characterized him. We have his own statement, that further reading and thinking had only increased his early passion. No one could admire more than himself, he said, the magnificence of American scenery, its great forests, rivers, waterfalls, and lakes; but Europe contained even more. He burned to visit the shores of the old world, to see its great personages, and explore the accumulated beauties and treasures of the past. Sailing from New York in May, he duly reached Bordeaux, travelling thence through the south of France, and by Nice, to Genoa. Here, in the picturesque old city of palaces, he passed two months. He then sailed to Messina, made the tour of Sicily, and crossed over to Naples. From Naples, in the spring of 1805, he proceeded to Rome, where he made a brief sojourn and contracted an intimate friendship with the celebrated painter Washington Allston. In a paper containing many interesting reminiscences of his friend, originally contributed to Duyckinck's "Cyclopedia of American Literature," and written in his most delightful style, he declares that this intimacy with Allston "came near changing his whole course of life." After one of the rambles of the friends through the beautiful scenery around the city, they returned at sunset when the landscape reposed in its most enchanting beauty. As he gazed upon the scene, it suddenly occurred to Irving that to live in Italy and become a painter would be far more delightful than to return to New York and practise law. He had taken lessons in drawing in America, had a decided fondness for it, and, his friends said, an equal talent. Allston caught at the suggestion with ardor, and for three days the future author was possessed by the determination to become a painter. The project, however, was never carried out. The idea, originating from the influence of the lovely evening and his romantic friendship, was given up; and the friends soon parted, Allston to pursue his studies and his dreams, Irving to continue his travels. Passing through Switzerland, he arrived at Paris, in which gay capital he resided several months. Finally, England, the chief object of his youthful love and curiosity, drew him irresistibly toward her shores. He proceeded to London by the roundabout route of Flanders and Holland; having thus traversed, in about 18 months, many of the fairest and most suggestive scenes of the old world. The opportunity of collecting materials for future work had not been neglected. Everywhere the quick and observant eye of the young American had been open to the peculiarities of life and character which passed before him. Alive to the passionate romance of Italy, and to the sentiment and humor of France and the Rhine land, he stored in his vivid and tenacious memory the details of many wild legends and imposing landscapes, afterward to be reproduced in his volumes. After a brief stay in England, he returned to New York in March,

1806, and, going back to his law studies, was admitted in due course to the bar. But he never practised the profession. It seems to have possessed no attractions for the young man, all of whose thoughts were turned toward literature. The prospect before an author at that period was, however, utterly discouraging. Few persons "read an American book," unless it treated of politics or some practical subject. For these the young writer had no genius. If he wrote at all, he must write in his own way, and on the topics which interested his fancy. To such work he accordingly proceeded. With James K. Paulding and his elder brother William, who had married Paulding's sister, he projected a serial publication intended to satirize the ways of the hour in New York—"to simply instruct the young, reform the old, correct the town, and castigate the age. This is an arduous task," added the gay young critics, "and therefore we undertake it with confidence." The plan was carried out in "Salmagundi, or the Whim-Whams and Opinions of Launcelot Langstaff, Esq., and Others," which appeared in small 18mo. numbers from time to time, under the auspices of David Longworth, an eccentric bookseller, whose shop was variously denominated by himself the "Shakespeare Gallery" and the "Sentimental Epicure's Ordinary." The first number of the serial was published Jan. 24, 1807, and created a great sensation. The town hailed with delight the rich humor, the keen wit, and the personal squibs of the publication. It was continued during a year, and filled 20 numbers, to which the three authors regularly contributed. No distinct announcement has ever been made of the part borne by each of the writers; but the poetical epistles are said to have been written by William Irving, and the prose papers to have proceeded in about equal measure from his associates. Those by "Anthony Evergreen, Gent.," bear internal marks of the pen of Washington Irving, whose intention, it is said, was to have married Will Wizard to the eldest Miss Cockloft, and to have embraced the occasion of describing a grand wedding at Cockloft Hall, the original of which mansion was the residence of Gouverneur Kemble on the Passaic, whither Irving went frequently in his early days. The pleasant portrait of "My Uncle John" is understood to have been the work of Paulding; and from his pen also proceeded the original sketch of "Autumnal Reflections," which was, however, extended and wrought out by Irving. Launcelot Langstaff, Esq., whose portrait adorns the title page of the original edition, is thought to have been Denie, an author of the period. "Salmagundi" became a work of more character and importance than its writers probably anticipated. Designed for the amusement of an idle hour, and to raise a little laughter at local follies, it finally became a great favorite throughout the whole country, and formed in New York a distinct school of wit and humor. The work indeed possesses great variety of character and in-

cident. The humor and pathos are delicate and natural; the local pleasantries and gossip are recorded with a spirit unsurpassed since the days of Addison. It would be difficult to find in the subsequent works of the authors any better comedy than the military muster, or Will Wizard's visit to the "modern ball;" and the sketch of the Cockloft family and mansion is as fine as any thing in the "Sketch Book." "Blackwood's Magazine" declared the work "quite superior to any thing of the kind which this age has produced;" and it continues to occupy a prominent position among the most characteristic and animated productions of its writers. A little less than two years after the termination of the serial, appeared "A History of New York, from the Beginning of the World to the End of the Dutch Dynasty, &c., by Diedrich Knickerbocker." It was commenced by Washington Irving, in company with his brother Peter Irving, the design of the writers having been to parody a handbook which had just appeared with the title, "A Picture of New York." This publication contained a historical account of the city, and the brothers aimed at a burlesque narrative of the same events. Dr. Peter Irving sailed soon afterward for Europe, and thus the work remained solely in the hands of Washington Irving. Finding the capabilities of the subject greater than he had supposed, he elaborated it with care, and finally produced a work in two volumes. To attract attention to the publication, advertisements were inserted in the "Evening Post," calling for information of "a small elderly gentleman dressed in an old black coat and cocked hat, by the name of Knickerbocker," who had disappeared from his lodgings at the Columbian hotel in Mulberry street; then a statement that the old gentleman had left "a very curious kind of a written book in his room," which, unless he returned, would be disposed of to discharge his bill at the tavern; finally the work was duly announced. It attracted immediate attention, and was by many persons at first supposed to be a veracious history of New York. A venerable clergyman, it is said, commenced it in good faith, and only discovered his mistake when the broad humor and extravagance of the narrative betrayed it. A still more amusing fact is the citation of the work by Göller, a German editor of Thucydides, in illustration of a historical passage, in the words: *Addo locum Washingtonis Irvingii Hist. Novi Eboraci, lib. viii. cap. 5.* With every lover of genuine humor the book became an early favorite; but some of the descendants of the Dutch resented it, as an attempt to ridicule their ancestors. In an address before the New York historical society it was gravely held up to public reprehension, as a most unjustifiable burlesque of the past of the commonwealth. To the last revised edition of the work Irving prefixed an "Apology," in which he defends himself pleasantly against these criticisms. His design, he declares, had a bearing wide from the sober

aim of history. It was to embody the traditions of New York in an amusing form; to illustrate its local humors, customs, and peculiarities; and to clothe home scenes, places, and familiar names with those imaginative and whimsical associations so seldom met with in America. He declares that he has made the old Dutch times and manners popular, and humorously alludes to the innumerable Knickerbocker hotels, steamboats, ice carts, and other appropriations of the name, asserting that the general good feeling and hilarity of the people have been promoted by his work, which has formed "a convivial currency, linking our whole community together in good humor and good fellowship; the rallying point of home feeling; the seasoning of civic festivities; the staple of local tales and local pleasantries." The publication was scarcely known at the time in Europe; but when the author had made his way to the English heart by the "Sketch Book," "Blackwood's Magazine" (July, 1820) and the "Quarterly Review" (March, 1825) spoke of it in terms of discriminating praise. The magazine declared that the matter of the book would "preserve its character of value long after the lapse of time had blunted the edge of the personal allusions," and that Irving was "by far the greatest genius which had appeared upon the literary horizon of the new world." The review compared the style to that of Swift's "Tale of a Tub," and lamented that English readers were unable, from ignorance of the local allusions, to enjoy "a treat indeed." Edward Everett, in the "North American Review," declared it "a book of unwearying pleasantry, which, instead of flashing out, as English and American humor is wont, from time to time, with long and dull intervals, is kept up with a true French vivacity from beginning to end." Though the entire justice of this last criticism may be questioned, the work is in Irving's best vein. The style is easy, polished, and full of a native and unlabored grace. The humor varies from the broadly comic to the subtle and delicate. The descriptions of scenery and character are frequently serious and instinct with beauty; but the work will be chiefly valued for its finished portraits of former manners, and of the old Dutch worthies around whose figures the author has thrown all the decorations of his affluent humor. For some years after the publication of the Knickerbocker history Irving produced no new work. In 1810 he wrote a biographical sketch of Thomas Campbell, for an edition of his works about to appear in Philadelphia. This was done at the request of Archibald Campbell, a brother of the poet, who was residing at the time in New York. The sketch served afterward to secure the friendship of Thomas Campbell in London. Irving had meanwhile engaged with two of his brothers in mercantile pursuits, as a silent partner. But his literary inclinations were as strong as before, and in 1813-'14 he edited the "Analectic Magazine" in Philadelphia, to which he contributed

a series of eloquent biographies of the naval commanders of America. In 1814 he joined the staff of Gov. Tompkins as aide-de-camp and military secretary, with the title of colonel. On the termination of the war he was again seized by his old passion for travel, and sailed a second time for Europe. He probably intended his visit to be a short one; but he remained absent 17 years. The career which we are now about to follow was on the soil of the old world, from which he was to return to his native land crowned with great and deserved honors. The anonymous satirist of "Salmagundi" and "Knickerbocker" was to become the author of the "Sketch Book" and the "History of Columbus;" the unknown essayist to be hailed as the first and most delightful humorist of the age. In London he made the acquaintance of many persons of congenial tastes, among whom were the poets Procter and Campbell. Leslie, the distinguished artist, whom Irving had probably known in Philadelphia, was also here. They wandered about London in company, observing odd characters, and unconsciously collecting materials, the one for his books, the other for his pictures. At this period Irving probably mingled with the singular characters who form the groundwork of some of the sketches in the "Tales of a Traveller;" and, on his numerous excursions in company with Leslie, gathered the sunny details and coloring of the English portion of the "Sketch Book." These excursions extended to Stratford-on-Avon, and into the mountains of Wales. From his way-side adventures, and the genial scenes through which he passed, Irving returned to London, pervaded with the influences of the rural life of England. In due time, his experiences were to prove of value. In 1817 he visited Edinburgh and the highlands of Scotland; and on his return paid a visit to Sir Walter (then Mr.) Scott. Campbell's letter of introduction paved the way, and on a fine August morning he drove up to Abbotsford. Scott had read with admiration a copy of "Knickerbocker" sent him by Mr. Henry Brevoort from New York, and welcomed his visitor "with delight," says Lockhart. He was at breakfast, but sallied forth surrounded by dogs and children, greeting Irving cordially before he had issued from his chaise. He wrote to a friend soon afterward: "When you see Tom Campbell, tell him, with my best love, that I have to thank him for making me known to Mr. Washington Irving, who is one of the best and pleasantest acquaintances I have made this many a day." To Mr. Brevoort he wrote that "Knickerbocker" reminded him both of Swift and Sterne, and made his sides "absolutely sore with laughter." Thus passed in travel, in rural wanderings, and in pleasant social intercourse, the first year or two of Irving's stay in England. But a cloud was approaching. Soon after his visit to Scott, the house with which he was connected in New York yielded to the commercial revulsion after the war, and failed. The whole of Irving's property was invested in the

business, and the result reduced him suddenly to poverty. He does not seem, however, to have been greatly cast down. Thrown thus on his own resources for support, he returned to literature. His journeys and explorations in England naturally suggested themselves, and the plan of the "Sketch Book" was the result. All the papers with two exceptions were written in England, and sent "piecemeal" to New York, where they were published (1818) in the form of octavo pamphlets. When the first volume had appeared in this form, it attracted the attention of William Jerdan, editor of the London "Literary Gazette," who inserted some of the numbers in his periodical, with high commendation. Soon afterward, hearing that a London publisher was about to print the work without his sanction, Irving offered it to Murray, from whom he had received many friendly attentions. The result was disheartening. Murray "entertained the most unfeigned respect for the writer's talents," but politely declined publishing the volume, with a courteously worded but unmistakable intimation that it would not remunerate him for the trouble and expense. Meeting with such ill success in London, Irving determined to attempt Edinburgh, and fixed upon Constable. Knowing Scott's relations with that publisher, and convinced of his friendly regard for himself, he sent the printed numbers of the "Sketch Book" to Abbotsford, accompanied by a note in which he explained his condition. A reverse, he said, had taken place in his fortunes since the visit to Abbotsford, and he was now obliged to depend upon literature for a support. He requested Scott to look at the pamphlets, and, if he thought them worthy of European republication, to ascertain if Constable would bring them out in a volume. Scott needed no second petition from a brother author in misfortune. He replied promptly and in his own generous style, that nothing could give him more pleasure than to do Irving a service. He had looked at the numbers of the "Sketch Book," he said, and thought them "positively beautiful." He would use every means to recommend them to Constable. Meanwhile, would Irving accept the editorial control of a new periodical about to be commenced at Edinburgh, with a salary of £500 a year, and prospects of further advantages? The publication might have a political bearing which would not suit Irving, but he would risk the offer, knowing "no man so well qualified for this important task, and because it will bring you to Edinburgh." The offer, and the manner of making it, were full of the kindness and delicacy of Scott's heart. Irving's reply was equally characteristic of himself, and presents so suggestive a picture of his literary character and habits that it is worthy of more than a passing notice. Scott's "genial sunshine" of heart, he declared, warmed every thing upon which it fell. The editorial proposal surprised and flattered him; but both his political opinions and his character debarred him from accepting the position. The course

of his life had been "desultory;" he was "unfitted for any periodically recurring task, any stipulated labor of mind or body. I have no command of my talents such as they are, and have to watch the varyings of my mind as I would those of a weathercock. Practice and training may bring me more into rule; but at present I am as useless for regular service as one of my own country Indians or a Don Cossack. I must keep on, therefore, pretty much as I have begun; writing when I can, not when I would. I shall occasionally shift my residence, and write whatever is suggested by objects before me, or whatever rises in my imagination, and hope to write better and more copiously by and by. I am playing the egotist, but I know no better way of answering your proposal than by showing what a good-for-nothing kind of being I am. Should Mr. Constable feel inclined to make a bargain for the wares I have on hand, he will encourage me to further enterprise; and it will be something like trading with a gypsy for the fruits of his prowlings, who may at one time have nothing but a wooden bowl to offer, and at another time a silver tankard." Such was the modest and manly reply of the future author of many a volume which proved a "periodically recurring task and stipulated labor." Scott's reply expressed regret, but the "most encouraging confidence of the success" of the "Sketch Book" republished. "Whatever my experience can command," he wrote, "is most heartily at your command. . . . I am sure you have only to be known to the British public to be admired by them. If you ever see a witty but rather local publication called 'Blackwood's Edinburgh Magazine,' you will find some notice of your works in the last number; the author is a friend of mine, to whom I have introduced you in your literary capacity. His name is Lockhart, a young man of very considerable talents, and who will soon be intimately connected with my family. My faithful friend Knickerbocker is to be next examined and illustrated. . . . I promise myself great pleasure in once again shaking you by the hand." The negotiation with Constable ended in nothing, and the first volume of the "Sketch Book" was put to press in London, at Irving's expense, in Feb. 1820. Miller, the publisher, failed, and the equanimity of the author was sorely tried. Scott arrived at the crisis in London, and, "more propitious than Hercules, put his own shoulder to the wheel." A few words to Murray arranged every thing. He bought the copyright for £200, which was afterward increased, with the success of the work, to £400. The train of incidents which thus connect the names of Walter Scott and Washington Irving will be regarded with enduring interest by every true lover of literature. The affectionate friendship which commenced at Abbotsford was only dissolved by the death of Scott. The tears which came to the eyes of the survivor, as he spoke of their last interview, were the silent witnesses of what he had lost. The "Sketch Book," though criti-

cized coolly by the "North American Review," was warmly welcomed by the leading periodicals of England. Lockhart had already recommended in "Blackwood's Magazine" (Feb. 1820) an English edition, and declared that "nothing had been written for a long time for which it would be more safe to promise great and eager acceptance." Lord Jeffrey said of the work, in the "Edinburgh Review" (Aug. 1820): "It is the work of an American entirely bred and trained in that country, originally published within its territory, and, as we understand, very extensively circulated and very much admired among its natives." The "remarkable thing," said the reviewer, was that the book should be "written throughout with the greatest care and accuracy, and worked up to great purity and beauty of diction, on the model of the most elegant and polished of our native writers." The legend of Rip Van Winkle was quoted as a specimen of the humor of the "Hesperian essayist," who possessed, said the critic, "exquisite powers of pathos and description." Blackwood again, in Jan. 1825, said: "The 'Sketch Book' is a timid, beautiful work, with a world of humor, so happy, so natural, so altogether unlike that of any other man, dead or alive, that we would rather have been the writer of it, fifty times over, than of every thing else that he has ever written." Thus cordially greeted by the two leading critical periodicals of Great Britain, the work soon attracted notice. Its genial sketches of life and scenery became greatly popular with all classes of readers. The "Sketch Book" is indeed in the author's most characteristic vein. The subjects are chosen with great skill; the style is pure and graceful, and the humor exceedingly sweet and natural. The legends of "Rip Van Winkle" and "Sleepy Hollow" are unsurpassed among the author's creations. The work diverges everywhere from the beaten track, and finds simple beauties by the wayside and in the cottage. In the preface, indeed, the writer compares himself to the artist, who, travelling through Europe, filled his portfolio with landscapes and old ruins, forgetting St. Peter's and the bay of Naples, and having "not a single glacier or volcano in his whole collection." This choice of subjects added greatly to the charm of the book; and the writer's delightful "sunshine of the breast" conciliated the affection of the reader. It continues to be the favorite work of Irving, in England and America, and wherever his books are read. From this time dates the author's active career in letters. The "Sketch Book" brought him honorable fame and fair profit. Soon afterward he projected a second work of a more extended character, upon a kindred theme. Spending the winter of 1820 in Paris, where he enjoyed the intimacy of the poet Moore, and mingled with the best English society, he commenced "Bracebridge Hall" in the spring of 1821. Moore notices in his diary the "amazing rapidity" of Irving's composition. In 10 days he wrote about 120 pages. "Bracebridge Hall, or the Humorists," was pub-

lished in 1822, Murray paying for the copyright, without seeing the MS., the sum of 1,000 guineas. If written throughout with the rapidity intimated by Moore, the work must have been carefully revised. It was a deliberate venture by an author who had fame to lose; and Irving was never a careless writer. The introduction contains an entertaining picture of the position of the author before the British public. His previous volumes, he said, had succeeded very far beyond his expectations; and their popularity was doubtless attributable to the surprise of Europeans at finding that an American could express himself in "tolerable English." He had been looked upon as "something new and strange in literature; a kind of semi-savage with a feather in his hand instead of one on his head; and there was a curiosity to hear what such a being had to say about civilized society." This novelty having been dissipated, his present work would be apt to suffer from the kind reception of the former ones; the world being prone to criticize severely an author who has been overpraised. His design, he said, was simply to paint scenery and manners—those English peculiarities which he had dwelt upon, in his wanderings, with childlike interest and delight. He left politics to abler heads, and aimed only to keep mankind in good humor. The conclusion of the preface very admirably sums up the life-philosophy of the author: "When I discover the world to be all that it has been represented by sneering cynics and whining poets, I will turn to and abuse it also; in the meanwhile, worthy reader, I hope you will not think lightly of me because I cannot believe this to be so very bad a world as it is represented." The leading critics differed upon the merits of the work. The "North American Review" (July, 1822) declared it "quite equal to any thing which the present age of English literature has produced in this department." "Blackwood's Magazine" (June, 1822) subjected it to a keen analysis. The author had been overpraised, said the critic, and people had become weary of hearing "Aristides called the Just;" but the punishment had duly been inflicted. "Rumor and all her crew seemed lying in wait for the former object of their applause," intent upon dragging down the idol. The work was a falling off from the "Sketch Book," added the critic, but contained many beauties in spite of its imitations of Addison. The "Edinburgh Review" (Nov. 1822) commended it highly, but with great discrimination. The author's "former level had been maintained in the work with marvellous precision." The charm lay in "the singular sweetness of the composition," which at times was almost cloying. "The rhythm and melody of the sentences," wrote the reviewer, "are certainly excessive." The criticism was just. The work suffers from the care and elaboration expended upon the style. The characters are, however, full of humorous individuality; and the sweet story of Annette Delabre is touched with the author's finest skill.

The book will rank among the best pictures of old English rural life and character. Passing the winter of this year at Dresden, Irving returned to Paris in 1823, and in Dec. 1824, published the "Tales of a Traveller." For this work he received from Murray before he saw the MS. £1,500, and "might have had £2,000." The introduction contains as usual an entertaining account of the origin of the tales. The author is laid up by sickness in the German town of Mentz. Having exhausted every means of entertainment at his inn, and even wearied of learning German, and repeating *Ich liebe* after rosy-lipped Katrina, the daughter of his landlord, he determines to throw aside the books of others, and write one for his own amusement. Rum-maging in his portfolio, and casting about in his memory for a traveller's floating recollections, he makes the "Tales of a Traveller," which he declares to be "strictly moral." "This may not be apparent at first, but the reader will be sure to find it out in the end." The "Adventure of the German Student" and the "Mysterious Picture" were vague recollections of anecdotes which he had heard; and the "Adventure of the Young Painter" had been taken nearly entire from an authentic MS. As to the rest, "I am an old traveller," he writes, "I have read somewhat, heard and seen more, and dreamt more than all. My brain is filled therefore with all kinds of odds and ends." He could say of no particular tale whether he had "read, heard, or dreamt it." The "Tales of a Traveller" was truly the result of wanderings in many lands. Italy furnished the wild tales of the banditti; Holland, the humor of the bold dragoon; London, Buckthorne and the club of queer fellows; and America, the legends of Kidd, Wolfert Webber, and Tom Walker. The work was severely criticized both in England and America, but the romantic tragedies and richly humorous sketches remain favorites with the young and uncritical. The winter of 1825 was spent by the author in the south of France, and early in the ensuing year he proceeded to a new field of labor. Alexander H. Everett, U. S. minister to Spain, at the suggestion of Mr. Rich, the American consul at Madrid, commissioned Irving to translate the important documents relating to Columbus just collected by Navarrete, and about to be published with the title *Coleccion de los viajes y descubrimientos*, &c. Instead of a translation, the result was a "History of the Life and Voyages of Christopher Columbus;" and afterward, in consequence of the success of the first production, the "Voyages and Discoveries of the Companions of Columbus." The first and principal work was published by Murray in 1828, and brought the author 3,000 guineas, together with one of the 50 guinea gold medals offered by George IV. for eminence in historical composition. The history became immediately popular, and was warmly eulogized by the leading critics. The "North American Review" (Jan. 1829) declared it to be "one of those works which are at the same time the delight

of readers and the despair of critics." The "Edinburgh Review" (Sept. 1828) said: "It will supersede all former works on the same subject, and never be itself superseded." Prescott wrote: "The task has been executed in a manner which must secure to the historian a share in the imperishable renown of his subject;" and added that the work was "the noblest monument to the memory of Columbus." (Ferdinand and Isabella, vol. ii. pp. 134, 509.) The chief adverse criticism of the history rested upon its too great length. A tour in the south of Spain in this and the following year enabled the author to embody in a picturesque form many romantic incidents collected in the course of his historical researches. This was done in a "Chronicle of the Conquest of Granada," for the copyright of which Murray paid £2,000; and again in "The Alhambra, or New Sketch Book." The first professes to be derived from the MSS. of a certain monkish historian, Fray Antonio Agapida. But the monk was soon discovered to be solely the creature of the author's imagination. The "Chronicle" was less popular than the author had expected, and resulted in loss to the publisher. The "Alhambra" was partly written in the old Moorish palace, in which Irving spent 3 months, and aimed to present a picture of the "half Spanish, half oriental" character of the original. The work was published in May, 1832, and dedicated to Wilkie, the artist. In 1835 appeared, on the same subject, "Legends of the Conquest of Spain," and afterward (1849-'50) "Mahomet and his Successors," which was derived in large measure from materials collected in Madrid. These works are written in an animated and poetical style, evidently arising from a deep interest in the romantic details of the Spanish and Moorish wars. In July, 1829, Irving returned to England, having received the appointment of secretary of legation to the American embassy at London; and in 1831 the university of Oxford conferred on him the degree of LL.D. When Mr. Van Buren succeeded Mr. McLane, he returned to America, arriving in New York, after 17 years' absence, May 21, 1832. His fame had long before preceded him. A public dinner, at which Chancellor Kent presided, testified to the pride which his countrymen felt in his honorable renown. A native modesty and aversion to display alone prevented him from receiving ovations throughout the land, from Boston to New Orleans. Irving was now in his 50th year, and might have been excused for resting after so many wanderings. But he did not return to America for repose. His active faculties craved new fields of exertion. Attracted by the wild life of the West, he accompanied Commissioner Ellsworth, in the summer of the same year, on his journey to remove the Indian tribes across the Mississippi. The result was "A Tour on the Prairies," which appeared in the "Crayon Miscellany" in 1835. "Abbotsford" and "Newstead Abbey" were afterward added to the "Miscellany," in the former of

which he describes his visit to Scott in 1817. The subject of the adventurous life of the West continued to interest him; and in the next year (1836) he published "Astoria," a picturesque account of the settlement of that name. Visits paid in his youth to the station of the north-west fur company at Montreal had excited his imagination; and from the papers of the "adventurers by sea and land" employed by John Jacob Astor, he derived all necessary information. The report that Mr. Astor had paid him \$5,000 to "take up the MSS." was in 1851 contradicted by the author, who published the work at his own expense, and received no more than his ordinary share of the profits. "Astoria" was succeeded in 1837 by the "Adventures of Captain Bonneville, U. S. A., in the Rocky Mountains and the Far West," prepared from the MSS. of that traveller, who had "strangely engrafted the trapper and hunter on the soldier." From 1839 Irving contributed for two years a series of papers to the "Knickerbocker Magazine," which had been commenced in 1833. A number of these articles, with others from the English annuals and periodicals, were in 1855 collected in a volume under the title of "Wolfert's Roost," another name for the residence of the author. The leading journals of America and England embraced the occasion to pay tributes full of respect and regard to Irving. In 1841 he published a life of Margaret Miller Davidson, to accompany an edition of her poetical remains. In 1842 he was appointed minister to Spain, which post he filled for 4 years. On his return he prepared for publication in a separate form "Oliver Goldsmith, a Biography," which had been prefixed to a Paris edition of that author's works. Though closely following the works of Prior and Forster, this life will continue to be read for the sweetness of the style, and the genial coloring of the picture of Irving's favorite author. In 1848-'50, at the instance of Mr. G. P. Putnam, he published a revised edition of his works in 15 volumes. The sale of this edition, up to Jan. 1857, was 250,000 volumes; and this, added to about the same number sold of former editions, gives an aggregate sale of Irving's works in America up to that date of about 500,000 volumes. In this estimate, 98,000 volumes of the "Life of Washington," sold to Jan. 1857, and the large sales of "Wolfert's Roost," are not included. This sale exceeds what has been claimed for the works called "sensation books," and is creditable to the taste of the nation. From the period of his return from Spain, Irving was more or less occupied by his last and longest work, the "Life of Washington." The first volume was published in 1855, and the fifth, completing the work, in Aug. 1859. The work is an elaborate narrative of the career of its subject, and full of dramatic interest. The personal details of Washington's private life are in the author's most pleasing style. An air of sober simplicity characterizes the work, and marks it as the production of one who had discarded the facile

humors of youth for the profound meditations and chastened dignity of age. For some years before his death the writer resided at his house of "Sunnyside," on the left bank of the Hudson, not far from the city of New York. It is in close vicinity to "Sleepy Hollow," of which he wrote long ago: "If ever I should wish for a retreat where I might steal from the world and its distractions, and dream quietly away the remainder of a troubled life, I know of none more promising than this little valley." The house of "Sunnyside" is the identical dwelling, represented as the castle of Baltus van Tassel, where Ichabod Crane paid his addresses to the little Dutch beauty Katrina, and in which the great country frolic took place. It is a poet's cottage, lost in verdure and flowers, nestling down on the banks of that beautiful river, which the master of the mansion has illustrated and adorned by his genius. The house is in the genuine Dutch style, and every thing about it is redolent of old days. "A venerable weathercock of portly dimensions," says Irving in a communication to the "Knickerbocker Magazine," "which once battled with the wind on the top of the stadt house of New Amsterdam in the time of Peter Stuyvesant, now erects its crest on the gable end of my edifice. A gilded horse in full gallop, once the weathercock of the great Van der Heyden palace of Albany, now glitters in the sunshine and veers with every breeze on the peaked turret over my portal." Of the great river he adds: "The Hudson is, in a manner, my first and last love; and after all my wanderings and seeming infidelities, I return to it with a heartfelt preference over all the rivers of the world." Here, on the banks of the beautiful stream, away from "the world and its distractions," as he had wished, passed tranquilly the last years of Washington Irving. If his early life had been "troubled," his latter days were serene and happy. A great and honorable fame had come to greet him, and a public affection based upon the genial goodness of his heart. A very deep and sincere piety was however the great element of his happiness—a religious conviction, heartfelt and unaffected, which often caused him to shed tears as he listened to the solemn service of the Episcopal church, to which he belonged. He was never married, in consequence of the death of a young lady, Miss Hoffman, whom he had loved, and whose Bible, "an old and well-worn copy, with the name in a delicate lady's hand," lay on the table by his bedside when he died; but the children of his relatives and friends were dear to him, and a genial family circle, consisting of his brother and his nieces, made the hospitable home of Sunnyside as bright and pleasant as its name. Irving's age was not exempt from infirmity. A chronic asthma caused him often great pain, but he bore it with manly patience. His death was occasioned by a sudden stroke of disease of the heart, and took place, soon after he had retired to his chamber, on the night of Nov. 28, 1859.

The intelligence caused profound sorrow and regret throughout the country. Honors were paid to his memory by numerous historical and literary societies, in which the most eminent men bore their testimony to the extent of the public grief and loss; and on Dec. 1, the day of his funeral, the bells of New York city were tolled, in accordance with the suggestion of the civic authorities, and the flags in the harbor and on the public buildings displayed at half mast. A great procession of relatives, friends, and representatives of various institutions, followed the hearse to the graveyard at Tarrytown; and many eloquent sermons were delivered by prominent divines, eulogizing the piety and goodness of Irving's character. He was borne to his grave by a road which winds through "Sleepy Hollow;" and near that place, rendered famous by his genius, he now sleeps.—This article would not be complete without some estimate of the genius of Irving, and the peculiar significance of his career. In more than one sense, he was a representative man. His first publication, though moulded in the style of Addison and Goldsmith, was a distinctively American production. It employed the methods and machinery of the "Spectator," but the material was drawn from the social life of New York, and the satire was directed against the special follies of the time. Thus, in the beginning of his career, the author opened a new literary vein. All that has since been written in this department may be traced back to "Salmagundi." The next work of the writer was an undoubted literary creation. In the Knickerbocker history he followed the bent of his genius, without aid from other writers, and the result was a purely original work, which has stamped with an enduring impression the early history of his native state. Few persons have any other views upon the subject than those which they have derived from this author. As Shakespeare was Marlborough's English historian, so Irving, in the eyes of the great mass of readers, is the classic annalist of New York. Knickerbocker has become a national word. It sums up and describes the Dutch life and character, and defines the spirit of a period and a race. Rarely is it given to a single writer to thus mould and color the records of a country. The student may efface the grotesque impression by laborious investigation of the actual facts; but the world at large will continue to peruse the history of Diedrich Knickerbocker. From the new world Irving passed to the old. In the "Sketch Book" he proved to the English critics that an American was not necessarily a savage. The literature of the West was at that time held by Europeans in undisguised contempt. An American author was regarded as a species of *lusus naturæ*. In the face of this rooted and almost universal prejudice, Irving extorted from the most famous critics of England unqualified commendation and respect. His grace and purity of diction were compared to Addison's, and his powers of pathos and description pronounced exquisite. "Bracebridge Hall," by its

genial pictures of English life, further endeared him to the people of Great Britain; and the amiable courtesy and refinement of the writer personally, changed the popular idea of the American character. The western world could have sent to the mother country no citizen more peculiarly adapted to remove old prejudices, and elevate her in the opinion of Europe. Nor were his services less valuable to the literature of England. He came to purify it at the moment when a hand was needed. The cordial good humor which shone in his pages had almost disappeared from books. To love humanity seemed a lost ambition. Byron had succeeded in making crime romantic, and misery itself attractive. To dissipate these chimeras was the mission of Washington Irving. He brought from the grave the kindly humor of Addison, and the tender sweetness of Goldsmith. The reader, after so often groaning with Manfred, or sneering with Don Juan, was glad to laugh at the mishaps of Ichabod Crane, or feel his eyes grow moist at the pathos of the "Widow's Son." The works of Irving were healthful and full of sunshine. They drove away the melodramatic mists and miasma, and purified the atmosphere of the epoch. Smiles again came in fashion, and sneers and frowns disappeared. The "Hesperian essayist" had conquered by wit and good feeling, by courtesy, kindness, and the charm of his exquisite pathos and humor. The production of the "History of Columbus" fortified Irving in his honorable position, and greatly increased his reputation; it proved his possession of high talents for the graver departments of writing. When he returned to America after his prolonged exile, he brought with him the admiration and affection of eminent Europeans; and this honorable renown was reflected upon the land of his birth. That the high position of Irving is merited, few persons will be disposed to deny. His fame is already historical. His good fortune during the period of the publication of the "Sketch Book" was conspicuous, but the genius which took advantage of it was equally so. The popularity of the writer was the result, chiefly, of the richness and delicacy of his humor. It was singularly original and natural. Cultivated by a diligent study of the best English models, it still possessed a coloring and flavor of its own. In some of his English pictures, he makes a dangerous approach to the author of the "Spectator;" but on his native soil he is wholly himself, and in every sense beyond imitation. The legends of "Rip Van Winkle," of "Sleepy Hollow," and of the Knickerbocker history, are, in the fullest meaning of the word, creations. The original growth of the native soil and sunshine, they resemble nothing which had preceded them. Like generous wine, their flavor seems only to grow richer as they increase in age. Humor is everywhere the distinguishing trait of Irving—a humor descending to the broadest farce, or penetrating to the hidden fountain of tears. It plays around the historical manuscripts

of the worthy Fray Antonio Agapida, and mingles exquisitely with the pathos of his serious pictures. Just, manly, natural, and free from all mawkish sentimentality, it has delighted old and young, the strong man and the invalid, the happy and the weary-hearted. The young appreciate it as thoroughly as their seniors, for it has its foundation in the feelings, and appeals to the instincts of the heart. Another conspicuous merit of Irving is the symmetry and just proportion of his works. They are often constructed with apparent ease and carelessness, but really with very great labor and art. The style is almost uniformly pure and graceful. Its melody is extreme; the music of its periods and pauses is sometimes even monotonous from its excess of sweetness. A tenderness almost feminine occasionally mingles with the humor. The last trait of this author which we shall notice is the vivid personality which shines through all his writings. It would be difficult to find in any literature a more marked instance of this peculiarity. Irving seems less to have composed tales and histories than to have written himself. His personality is always apparent—the manly, independent, hopeful, charitable human being. His humanity betrays itself under every disguise. Every emotion of his heart seems kindly, generous, and good. A respect for truth, and a deep sympathy with purity and innocence, shine in his pages. With a mind unsoiled by meanness, suspicion, or hatred, he surveys the drama of human life, and extracts from it a lesson of charity and love. Children and flowers are favorites with him. All is bright and warm in his heart. With the confiding familiarity of an intimate friend, he takes the reader by the arm, and points out the beauties of the landscape before him, gilding every object with the sunshine of his humor, and smiling with the happiest good nature. Few authors have been able to endear themselves so greatly to all classes of readers. The poetry which informs many brilliant passages is the delight of the imaginative reader; and the spirit of adventure ever and anon flashing out, attracts the lover of romance and travel. The respect which was felt for the author was even less than the public regard for the man. During his last years he received at Sunnyside the visits of his numerous friends, and conversed with undiminished interest upon every topic. His smile as he went back to former years was filled with the rarest sunshine. He thus seemed to be a link, so to speak, between the world of the past and the present—the person whom he addressed, and the great men whose friendship he had enjoyed. He was the living representative of a memorable epoch, and of a celebrated generation of men of letters. Of these notable names it is not too much to say, that none will continue to be cherished with greater affection or admiration than the name of Washington Irving.

IRVING, WILLIAM, brother of the preceding, an American merchant and writer, born in

New York, Aug. 15, 1766, died in the same city, Nov. 9, 1821. From 1787 to 1791 he was an Indian trader on the Mohawk river. In 1793 he married a sister of James K. Paulding, and afterward became a merchant in New York. Noted for wit and refinement as well as experience of the world, he was associated with the authors of "Salmagundi," to which he contributed most of the poetical pieces "from the mill of Pindar Cockloft." He also furnished hints and sketches for some of the prose articles, as the letters of Mustapha in Nos. 5 and 14, which were elaborated by his brother. From 1813 to 1819 he was a member of congress.—PETER, brother of the preceding, an American writer, born Oct. 30, 1771, died in New York, June 27, 1838. He studied medicine, but did not practise the profession, and in 1802 became editor and proprietor of the "Morning Chronicle" newspaper in New York. This was a democratic journal, and among its contributors were the editor's brothers Washington and John Treat, Paulding, William A. Duer, and Rudolph Bunner. He travelled in Europe in 1807, and on his return projected with his brother Washington the work which the latter developed into "Knickerbocker's History of New York." He returned to Europe in 1809, and remained abroad until 1836, publishing in the mean time from the press of Van Winkle a novel entitled "Giovanni Sbogarro, a Venetian Tale" (New York, 1820).—THEODORE, LL.D., nephew of the preceding, an American author, born in New York in 1809. He joined his uncle Washington Irving in Spain in 1828, and resided with him also in England. He was professor of history and belles-lettres in Geneva college, N. Y., from 1836 to 1849, and afterward held for 3 years a similar professorship in the free academy of New York. In 1854 he received orders in the Protestant Episcopal church, and he is now (1860) rector of St. Andrew's parish, Richmond, Staten island. Beside many essays contributed to periodicals, he is the author of the "Conquest of Florida by Hernando de Soto" (Philadelphia and London, 1835; new ed. 1851), which he began in Spain, and which is esteemed for its easy and elegant style; and of the "Fountain of Living Waters" (New York, 1854; 4th ed. 1855), a devotional work.—JOHN TREAT, cousin of the preceding, and son of Judge J. T. Irving, an American lawyer and author, born about 1810. His principal works are: "Indian Sketches" (Philadelphia, 1833; London, 1835), a narrative of an expedition to the Pawnee tribes; and two novels, the "Attorney" and "Harry Harson," which originally appeared in the "Knickerbocker" magazine under the signature of John Quod.

IRWIN, a S. co. of Ga., bounded N. E. by Ocmulgee river, and traversed by the Alapaha; area, 1,456 sq. m.; pop. in 1852, 3,618, of whom 551 were slaves. It has a level surface and a sandy soil, which is not very fertile except in the S. E. part. Pine forests occupy a large portion of the land. The productions in 1850

were 89,000 bushels of Indian corn, 51,437 of sweet potatoes, 25,126 lbs. of rice, 112 bales of cotton, and 37 hhds. of sugar. There were 12 churches, and 176 pupils attending public schools. Value of land in 1856, \$228,719. Capital, Irwinville.

ISAAC (Heb. *Yitzhak*, will laugh, whose birth caused laughter), the second patriarch of the Hebrews, son of Abraham and Sarah, younger brother of Ishmael, and father of Jacob and Esau by Rebekah. The narrative of his comparatively quiet and happy life is contained in Genesis, according to which he was born when his father was 100 years old, was circumcised on the 8th day of his life, was about to be sacrificed by his father on Mt. Moriah, but was saved by a divine interposition, lived partly as a nomad, partly as an agriculturist in the southern region of Canaan and in Philistia, and died blind at the age of 180, after having bestowed his chief blessing on his younger son Jacob, who, following the advice of his mother, had disguised himself to resemble Esau.

ISABAL, or IZABAL, a port of Guatemala, on the lake of Isabal or Golfo Dulce, in lat. 15° 24' N., long. 89° 9' W. It is a disagreeable landing place, on the S. side of the lake, in a hot pestiferous locality, and can only be reached by vessels of light draught. Its commerce is chiefly, if not entirely, at second hand through the British establishment of Balize, and is now rapidly falling off, owing to the transfer of the commerce of Guatemala to the Pacific. In 1855 the tonnage reaching Isabal amounted to 8,377 tons; in 1858 to but 6,007 tons; while the tonnage reaching the Pacific port of Guatemala, in the same period, rose from 12,600 tons to 20,043 tons.

ISABELLA THE CATHOLIC, queen of Castile and Leon, born in Madrigal, Old Castile, April 22, 1451, died Nov. 26, 1504. She was the daughter of John II. of Castile by his second wife, Isabella of Portugal, and was therefore descended, through both parents, from the famous John of Gaunt, duke of Lancaster. She was little more than 3 years old when her father died, leaving his crown to Henry, the offspring of his first marriage with Maria of Aragon. Until her 12th year Isabella lived with her mother in retirement in the small town of Arevalo. On the birth of the princess Juana, Henry removed his sister to court, the better to prevent the formation of a party for securing the succession to her instead of Juana. Remote as seemed her chances of a crown, with an elder brother on the throne, an heir to his body, and another brother living, Isabella was yet thought a fit match for the first princes of Europe. "Her hand was first solicited," says Preseott, "for that very Ferdinand who was destined to be her future husband, though not till after the intervention of many inauspicious circumstances." She was next, at the age of 11, betrothed to his brother Carlos, aged 40. This unequal union was prevented by the death of Carlos by poison, and in 1464 Henry promised her hand to Alfonso of

Portugal. With a firmness and discretion remarkable for her years, Isabella opposed this summary disposition of her person, saying that "the infantas of Castile could not be given in marriage without the consent of the nobles of the realm;" and Henry laid aside his selfish project, but only to take up another still baser. An insurrection, headed by the marquis of Villena and his uncle, the archbishop of Toledo, had been stirred up partly by the belief of many nobles that the princess Juana (often known as *la Beltraneja*), to whom the king had caused the oath of fealty to be taken, was the offspring of an amour between the queen and the royal favorite Beltran de la Cueva. The confederates proclaimed the transfer of the sceptre from Henry to his brother Alfonso, and collected an army to support their cause. Henry sought to detach the chief conspirators by marrying Isabella to the brother of the marquis of Villena, the profligate Don Pedro Giron, grand master of the order of Calatrava. The high-spirited princess vowed to plunge a dagger into Don Pedro's heart rather than submit to such dishonor, but the grand master died suddenly on his journey to the nuptials. Two years later (1468) Alfonso died, and the insurgents offered the crown to Isabella; but she refused it, and an accommodation was soon effected with Henry, by the terms of which the queen was to be divorced, and Isabella was recognized as heir to Castile and Leon, with the right to choose her own husband, subject to the king's approval. Isabella's claim to the succession was soon afterward solemnly ratified by the cortes. Henry, however, paid little regard to the terms of this agreement, and made another effort to force her to marry the king of Portugal. Policy and affection inclined her to the suit of Ferdinand, prince of Aragon, and, incensed at her brother's threats of imprisonment, she now resolved to take matters into her own hands, and returned the Aragonese envoy a favorable answer. Ferdinand signed the marriage contract at Cervera, Jan. 7, 1469, guarantying to his consort all the essential rights of sovereignty in Castile and Leon. Henry at once despatched a force to seize his sister's person, but Isabella escaped to Valladolid, and sent word to Ferdinand to hasten the marriage. The young prince, unable to procure an escort, as his father was then at war with the insurgent Catalans and utterly bankrupt, travelled in the disguise of a servant with 6 companions to Osma, escaping the troops of Henry posted to cut off his progress, and thence journeyed in more fitting state to Valladolid, where the marriage ceremony took place, Oct. 19, 1469. Henry now declared Isabella to have forfeited all the advantages guarantied by the previous treaty, and proclaimed Juana his lawful successor. The kingdom became divided by two hostile factions, Henry receiving the countenance of France, but Isabella gradually winning the affections and allegiance of the Castilians by her virtues and sagacity. At length, on Dec. 11, 1474, the king died, and 2 days later

Isabella was proclaimed queen at Segovia. Most of the nobles swore allegiance, but the party of Juana was still powerful, and it was not until after a war with Alfonso of Portugal, who had been affianced to Juana, that the queen's authority was fully recognized. From this time her career was truly brilliant. She applied herself to reform the laws and internal administration of the realm, to encourage literature and the arts, and to modify the stern and crafty measures of her husband by the influence of her own gentle and elevated character. Though the life and soul of the war against the Moors, in which she personally took part, even wearing armor, which is still preserved at Madrid, she was opposed to the cruelty which was then the established policy toward that people; and if she decreed the expulsion of the Jews from Castile, and gave a reluctant consent to the introduction of the inquisition, it was from a conviction that the safety of the Catholic faith demanded this sacrifice of her private feelings. The encouragement of Christopher Columbus is the deed by which she is best known to posterity, and the squadron with which he discovered America was equipped at her expense. She opposed the reduction of the Indians to slavery, and when a cargo of these captives was sent by Columbus to Spain, she ordered them to be transported back to their own country. With the aid of Cardinal Ximenes she reformed the religious orders, establishing thereby as firm a discipline in the church as she had already introduced into the state. Neither wealth nor station ever shielded criminals from her displeasure, and the sword of justice fell with equal certainty upon the nobility, the clergy, and the common offender. The masculine intellect, the feminine charms, and the rare virtues of Isabella have been a favorite theme for historians of all subsequent times, and the affection in which all her subjects held her person is still cherished throughout Spain for her memory. The sudden deaths of Don Carlos, Don Pedro Giron, and her brother Alfonso, so opportunely for her interests, left no stain of suspicion upon her. For Ferdinand she always entertained the warmest affection, which was not always faithfully returned. Her genuine piety colored every action of her life. In person she was equally beautiful as in character. She had a clear complexion, light blue eyes, and auburn hair. She had 5 children: Isabella, married to Emanuel of Portugal; Juan, a virtuous prince, who died in 1497, aged 20; Juana, who married Philip, archduke of Austria, and was the mother of the emperor Charles V.; Maria, who espoused Emanuel after the death of her sister; and Catharine, the wife of Henry VIII. of England. (See FERDINAND V.)

ISABELLA II. (MARIA ISABEL LUISA), queen of Spain, born in Madrid, Oct. 10, 1830. She is the eldest daughter of Ferdinand VII. and his 4th wife, Maria Christina. The question of her succession to the throne caused in Spain a bloody civil war and disorders whose

evil results have endured to the present day. Her father, having no son, repealed (March 29, 1830) the Salic law, introduced into Spain by Philip V., and named the expected offspring of his 4th marriage to succeed him, thus excluding his brother Don Carlos, who was then heir presumptive by virtue of that law. Ferdinand dying, Sept. 29, 1833, Isabella, then only 3 years old, was proclaimed queen. Don Carlos took up arms, supported by a large body of adherents, known as Carlists. The contest gradually assumed the worst form of civil war, the clergy taking sides with Don Carlos, while the queen's party was identified with that of the *exaltados*, liberals, or constitutionalists; the queen mother, who had taken the title of regent, having guaranteed a constitution to Spain. The young queen was supported by the majority of the people, and in 1834 it was almost unanimously agreed by the legislative cortes that Don Carlos and his descendants should be forever excluded from the Spanish throne; a decree which was confirmed by the constituent cortes in 1836. Peace was concluded, Aug. 29, 1839, at Bergara, and Don Carlos fled to France, Sept. 15. Meanwhile Gen. Espartero had acquired great power, placing himself in direct opposition to government. The two parties of *moderados*, or conservatives, and *exaltados*, or liberals, continued to divide the people, and between these vacillated the queen regent. The ministry of Martínez de la Rosa was succeeded by that of Mendizabal, who, compelled by liberal insurrections in Madrid and Saragossa, modified the constitution, enlarged the electoral law, and introduced other reforms. But the *juntas*, still dissatisfied, demanded the constitution of 1812, which was finally extorted by the insurrection of Madrid, June 18, 1837. To these troubles, productive of great misery and confusion in all Spain, succeeded the great insurrections of Barcelona and of Madrid in 1839, and the flight of the queen mother into France, Oct. 10, 1840. Espartero now became head of the government, and on May 8, 1841, was declared regent, and Argüelles became tutor of the queen. An unsuccessful rising in favor of Maria Christina was made at Pampeluna by Gen. O'Donnell, and an attempt by Gens. Concha and Diego Leon to get possession of the young queen's person and buy the adherence of the army was frustrated. Espartero was finally compelled by an insurrection of the friends of Christina and the radicals to abdicate. For a short time the guardianship of the queen was in the hands of Gen. Castaños; but the cortes, by advancing the majority of the queen 11 months, placed her on the throne, Nov. 10, 1843. The return of Christina was followed by the military dictatorship of Narvaez, the promulgation of anti-liberal laws, and a state of siege. On Oct. 10, 1846, Isabel was married to her cousin, Don Francisco de Assis, duke of Cadiz, and son of the infante Francisco de Paula, brother of Ferdinand VII., while at the same time her sister Maria Ferdinanda Luisa was married to the

duke of Montpensier, son of the French king Louis Philippe. The queen established alliances with Austria and Prussia, and sent an army to aid the pope. In July, 1850, she gave birth to a son, who died almost immediately. Narvaez was removed in Jan. 1851, and was succeeded by Bravo-Murillo. On Nov. 20 of the same year the queen gave birth to a daughter, Maria Isabella Francisca; on Nov. 28, 1857, to a son, Francisco de Assis Fernando; and in Dec. 1859, to another daughter. On Feb. 2, 1852, while going with her new-born daughter to church, she was attacked and slightly wounded by a priest named Merino, who was shortly after executed. This event was turned to account by the conservatives, who procured the dissolution of the cortes, and the adoption of repressive measures. Several liberal generals having been banished, on July 28, 1854, Gens. O'Donnell and Dulce headed a military and civil insurrection in Madrid, and succeeded in reestablishing a liberal government. The queen mother fled again to France, and the queen proclaimed an amnesty, recalled and restored exiles, opened a new cortes, and legalized the sale of church property. In 1856, an attempted *coup d'état* by O'Donnell, and the suppression of revolts in the south of Spain, gave the queen more power, reestablished the constitution of 1845, and recalled Narvaez. This induced the most reactionary measures, which in turn brought about a year later the fall of the Narvaez cabinet and the formation of a new ministry of a little more liberal character (Oct. 1857). O'Donnell has been prime minister since July 1, 1858, and is now (Feb. 1860) commander of an army sent to invade Morocco. The queen is beloved by her subjects, but her conduct since her alliance with a prince whose hand was forced upon her by the intrigues of Louis Philippe, and who is said to be affected with an infirmity which unfits him for the conjugal state, has proved injurious to her reputation.

ISABELLA OF ENGLAND. See EDWARD II. and III.

ISABELLA OF VALOIS. See ELIZABETH OF VALOIS.

ISABEY, JEAN BAPTISTE, a French miniature painter, born in Nancy, April 11, 1767, died April 18, 1855. He studied historical painting under David, but commenced his career by making portraits in crayons. About 1800 he determined to apply the principles of high art to miniature painting, and in 1802 executed an extensive work, representing the first consul reviewing his troops in the court of the Tuileries. This established the artist's reputation, and thenceforth, as long as he could paint, he remained at the very head of this branch of his art. Napoleon I., with whom he had been intimate in his youth, appointed him his miniature painter in ordinary, and the members of the Bonaparte family and the marshals and great dignitaries of the empire sat to him, beside many sovereigns and statesmen of Europe, of whom he painted a greater number than any contem-

porary artist. His *Table des maréchaux*, on a large slab of porcelain, representing Napoleon surrounded by his most famous generals, is a good specimen of his large portrait pieces. His picture of one of the conferences at Vienna, whither he had followed Maria Louisa on the abdication of Napoleon in 1814, is valuable from the number of historic portraits it embraces. He subsequently visited the Russian court at the invitation of the emperor Alexander. He continued in favor with successive dynasties in France, and died full of honors. His likenesses are remarkable for their exactness, and are executed with force as well as delicacy.

ISÆUS, one of the 10 Attic orators, born at Chalcis, lived between 420 and 348 B. C. He went at an early age to Athens, was instructed in oratory by Lysias and Isocrates, composed judicial orations for others, and founded a school of rhetoric in which Demosthenes is said to have studied. In antiquity 64 orations were ascribed to him, of which 11 are extant, all of them relating to disputed inheritances. The best separate edition is that by Schömann (8vo., Greifswalde, 1831). There is an English translation by Sir William Jones (London, 1794).

ISAIAH, the first of the great Hebrew prophets, son of Amoz, flourished under kings Uzziah, Jotham, Ahaz, and Hezekiah, from about 760 to 710 B. C. Ahaz was consoled by his prophecies when King Rezin of Damascus and Pekah of Israel warred against Judah. When Sennacherib, king of Assyria, appeared before Jerusalem in the reign of Hezekiah, Isaiah foretold the destruction of his army. The leading themes of his prophecies are the captivity in Babylon and the return from it, and the universal reign of justice. His eloquent style and sublimity of thought give him the highest rank among the prophets. Many critics suppose the latter portion of the book of Isaiah (chap. xl. to lvi.) to be by some author of the time of the captivity, whose name is unknown. Among the most important commentators are Lowth (London, 1775), J. A. Alexander (2 vols., New York, 1846-'7), Barnes (2 vols., New York), Gesenius (3 vols., Leipsic, 1820), Hitzig (2 vols., Heidelberg, 1833), and Dreesler (3 vols., completed by Delitsch and Hahn, 1857).

ISAMBERT, FRANÇOIS ANDRÉ, a French politician and jurist, born in Anay, Eure-et-Loire, Nov. 30, 1792, died in Paris, April 13, 1857. He was graduated at the college of Chartres, and during his legal studies assisted Gail, lecturer on Greek literature at the college of France, by preparing for him the maps of his great atlas to Herodotus and Strabo. In 1818 he was admitted an advocate before the councils of the king and in the court of cassation. During his professional career he aided in compiling the *Recueil général des lois Françaises* from 420 to 1789, published the *Collection des lois de la restauration de 1814 à 1827*, and was associate editor of the *Bibliothèque historique* and of the *Courrier Français*. He was a liberal in politics, and in 1818 he defended Dr. Aubry,

in 1821 the editors of the *Médaille constitutionnelle*, and in 1822 Gen. Berton and Lieut. Col. Caron, condemned to death for endeavoring to restore the empire. In 1824 he defended Armand Carrel. In 1826 he obtained a decree annulling the sentence passed on Bissette, Fabien, and Volny for circulating in Martinique a pamphlet on the condition of the free blacks in the French West Indies. After the revolution of 1830 he was at first appointed director of the *Bulletin des lois*, an unprofitable post, which he soon resigned, when his friend Dupont de l'Eure, minister of justice, employed him in a non-official capacity, and through his influence he became a member of the court of cassation, Aug. 27, 1830. In October he was elected to the chamber of deputies, where he sustained the ministry of Lafitte and Dupont de l'Eure. The ministry of Casimir Périer sent him back into the opposition, where he remained for 16 years. In 1834 he discovered a diplomatic document on which was based the rejection of the bill for the ratification of the treaty with the United States. In the same year he founded a society for the abolition of slavery in the French colonies. In 1838 the mulattoes of the colonies had a medal struck in his honor. Immediately after the revolution of 1848 Isambert was elected to the constituent assembly, where he advocated the closing of the clubs, though still maintaining his liberal principles. After 1849 he devoted himself to legal literature, and also published a number of antiquarian works.

ISAURIA, in ancient geography, a district in Asia Minor, bounded by Phrygia, Lycaonia, Cilicia, and Pisidia, containing few towns, and known to the ancients chiefly by the marauding excursions of the Isauri, who dwelt in its mountain fastnesses. The Romans sent an army against them in 78 B. C. under P. Servilius, who reduced them to submission and gained the surname of Isauricus. As they continued their depredations, the Romans undertook to check them by confining them within a circle of fortresses. In the 3d century A. D. the Isaurians and Cilicians united themselves into one nation, and one of their chiefs, Trebellianus, dared to assume the title of Roman emperor, but was conquered and put to death. They were formidable to the Byzantine emperors, and two of their race, Zeno (474-'91) and Leo III. (717-'41), rose to the Byzantine throne. The capital of Isauria was Isaura, at the foot of Mt. Taurus.

ISCHIA (anc. *Ænaria* and *Inarime*), an island in the Mediterranean, at the N. entrance of the bay of Naples, belonging to the kingdom of the Two Sicilies; area, 26 sq. m.; pop. 24,000. Its coasts are steep and rocky, and its centre is occupied by the volcano of Æpomeo, 2,500 feet above the sea, whose last eruption was in 1301. There are also 12 smaller volcanoes. The intervening valleys are of extraordinary fertility, and produce corn, wine, and fruits in abundance. Its warm baths, the most celebrated of which are those of Casamicciola and Lacco, are much frequented, and, with its salubrious cli-

mate and luxuriant vegetation, make it a favorite resort in every season of the year. It has 4 small towns, Ischia, Foria, Casamicciola, and Lacco. In 1807 it was captured by the English and Sicilian troops.

ISCHL, or ISCHIL, a fashionable German watering place, capital of the district of the Salzkammergut, Upper Austria, situated on the river Traun, in the centre of 3 valleys, surrounded by picturesque mountains, 50 m. from Linz and 44 m. from Steyer; resident pop. about 2,000; annual visitors, 1,000. In the vicinity of the village are extensive salt works, established in 1822. It contains several churches, schools, and elegant bathing establishments. A suspension bridge crosses the Traun, at the junction of the Ischl. It is a favorite resort of the Austrian nobility and of the present emperor of Austria. The Austrian premier Schwartzberg and the Russian ministers Nesselrode and Meyendorff met there in 1850, and the emperor of Austria and the king of Prussia in 1851.

ISÈRE. I. A river of Europe, which rises in Savoy, flows W., N. W., and S. W. into France, when it turns nearly S. and proceeds in this direction to below Grenoble, where it bends to the N. W., and again within a short distance to the S. W. Having passed St. Marcellin, it enters the department of Drôme, and falls into the Rhone near Valence. Its entire length is about 180 m., and it is navigable for more than 80 m. The Isère is narrow but deep; and its waters are always of a blackish tint, owing to the débris which it receives from the slate quarries of the Tarrentaise. Its chief affluents in Savoy are the Arly and Arc; in France, the Ozeins, Drac, and Bourne. II. A S. E. department of France, formed from the old province of Dauphiné, named from the river Isère, bounded W. and N. by the Rhone, which separates it from the departments of Ardèche, Loire, Rhone, and Ain, E. by Savoy, S. E. and S. by the department of Hautes-Alpes, and S. W. by that of Drôme; area, 3,201 sq. m.; pop. in 1856, 576,637. The surface in the S. districts is very mountainous, but in the centre and N. it frequently expands into extensive plains. There are at least 20 mountain peaks, the lowest over 6,000 feet high, and the most elevated, Le Grand Pelvoux, 13,158 feet high. The principal rivers are the Isère, Drac, Romanche, Bourbre, Guiers, and Rhone. The soil of the lowlands is in general very fertile. Agriculture is in an advanced state. The quantity of wine made annually averages over 5,000,000 gallons; that made in the valley of the Rhone has been long celebrated. The raising of silk is an important branch of industry. There are mines of iron, copper, lead, and coal; and gold, silver, platinum, zinc, antimony, &c., are found. The staple manufactures are hardware, linens, cotton yarn, &c. Capital, Grenoble.

ISERLOHN, a town of the Prussian province of Westphalia, 6 m. W. of Arnsberg; pop. about 13,000. It is remarkable for its manufactures of iron, steel, bronze, needles, &c. The manu-

facture of iron was in operation there as early as the middle ages. That of brass dates from the 18th century. The other manufactures belong to a more recent period. The country around Iserlohn is diversified with picturesque ruins, rocks, glens, and valleys. In the vicinity of the town is the celebrated Felsenmeer (sea of rocks), and a remarkable sounding cave containing fossil bones.

ISHMAEL, son of Abraham and Hagar, born in Mamre. After the birth of a son to Sarah, she persuaded Abraham to banish Hagar and Ishmael, and from that time Ishmael dwelt as a hunter in the wilderness of Paran. His 12 sons became the heads of 12 tribes dwelling in the Arabian desert between Egypt and Assyria under the name of Ishmaelites or Hagarenes.—In the 10th century A. D. the name of Ishmaelites was assumed by a Mohammedan free-thinking sect in Syria and Persia, which was associated with the fanatical assassins or Batenites.

ISIDORUS. I. OF CHARAX, a geographer who probably lived in the early part of the 1st century. He was the author of a great geographical work in which the Greek and Roman world and the Parthian empire were described. There are several quotations in Pliny from this treatise, the extant fragments of which have been repeatedly published in modern times among the remains of the *Geographici Minores*. The best edition is that of Miller (Paris, 1839). II. OF PELUSIUM, in Egypt, a Christian saint and abbot in the 1st half of the 5th century. He was a great admirer of Chrysostom, whose cause he espoused against the patriarchs Theophilus and Cyril of Alexandria. Over 2,000 of his letters have been preserved. The best edition of them is that published at Paris in 1638. III. OF SEVILLE, a saint of the Latin church, born in Carthage, Spain, died April 4, 636. He succeeded to the see of Seville about 600, and was esteemed the most eloquent orator, the profoundest scholar, and the ablest prelate of his age. In 616 he presided at the 2d council of Seville, and in 633 at the great council of Toledo. He wrote on science, art, history, and theology; the most curious and important of his works is *Originum sive Etymologiarum libri XX.*, an encyclopædia of all the arts and sciences then known. The best complete edition of his works is that of F. Arevali (Rome, 1797-1803).

ISINGLASS. See GELATINE.

ISIS, the principal goddess of the Egyptians, the wife of Osiris, and the mother of Horus. She was adored as the great benefactress of Egypt, and instructed her people in the art of cultivating wheat and barley, whence those cereals were always carried in her festal processions. In Greece, where her worship had been introduced at a very early period, she was occasionally addressed as Pelagia, the queen of the sea. From Greece her worship passed into Italy, and was established about the age of Sylla at Rome, where it became popular. In 43 B. C. the triumvirs, in order to ingratiate themselves with the people, commanded a temple of Isis

and Serapis to be founded, and publicly sanctioned their worship. The principal Roman temple of Isis stood in the Campus Martius, and hence the goddess was often called Isis Campensis. The Romans identified with her a native goddess of the Gauls, Sicilians, and Germans. The priests of Isis wore linen garments, and her votaries in the public processions wore masks representing the heads of dogs. In works of art she usually appears with the figure and face of Juno, arrayed in a long tunic, wearing a wreath of lotus flowers, and in her right hand a *sistrum*.

ISLAM, an Arabic word signifying full submission to God. It is used by Mohammedans to designate their religion, and also the whole body of believers, or those who accept the formula of faith: "There is no God but Allah, and Mohammed is his prophet." This formula or profession of faith is understood to include 5 essential articles of religion: 1, the acknowledgment of the divine unity and of the mission of Mohammed; 2, observance of prayer; 3, almsgiving; 4, keeping the fast of Ramadan; 5, the pilgrimage to Mecca. The Shieahs, or adherents of Ali, who are dominant in Persia, add to the declaration of faith: "Ali is the vicar of God." But the Soonnees or orthodox Mohammedans, who form the majority of the church of Islam, reject the position thus assigned to Ali. (See ALI BEN ABU TALEB.)

ISLAY, or ISLA, an island of Scotland, in the Atlantic ocean, 15 m. from the coast of Argyleshire, to which it belongs. It is the southernmost of the Hebrides; length about 28 m., breadth about 18 m.; area, 154,000 acres; pop. in 1851, 12,334. The surface of the E. part is hilly, and mostly wooded, but the remainder is generally level. Some of its summits are 1,500 feet high. It contains several small lakes and rivers, which abound with salmon and trout. Loch Finlaggan, near its centre, is about 3 m. in circumference. In this lake is an islet where the Macdonalds, "the lords of the isles," once resided, and where the ruins of their castle still are. The climate is moist, but tolerably healthy. The soil of the lowlands is very fertile and well cultivated. The staple manufacture is whiskey, which is of superior quality, and of which over 200,000 gallons are made yearly. In 1843 the island was purchased as an investment by the late Mr. Morison of London for \$2,225,000. Chief town, Bowmore; pop. about 1,200.

ISLE OF FRANCE. See MAURITIUS.

ISLE OF MAN. See MAN.

ISLE OF PINES. See PINES.

ISLE OF WIGHT, a S. E. co. of Va., bounded N. E. by the estuary of James river, and S. W. by the Blackwater; area, 400 sq. m.; pop. in 1850, 9,353, of whom 3,395 were slaves. The surface is generally level and divided between swamps, pine forests, and farming lands. The soil is thin and sandy. The productions in 1850 were 315,609 bushels of Indian corn, 89,713 of sweet potatoes, 3,799 of wheat, and 7,904 lbs. of wool. There were 19 churches and 149 pupils attending public schools. Value of real

estate in 1856, \$1,365,049, showing an increase of 12 per cent. since 1850. Capital, Smithfield.

ISLE OF WIGHT. See WIGHT.

ISLINGTON. See LONDON.

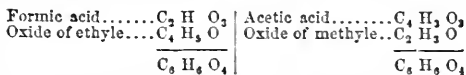
ISNARD, MAXIMIN, a French political orator, born in Grasse, Provence, Feb. 16, 1751, died there in 1830. In the legislative assembly in 1791 he gained notoriety for his eloquence and boldness, contributed to the insurrection of Aug. 10, and was reelected to the convention. He then modified his political views, joined the Girondists, was instrumental in the establishment of the committee of public safety, of which he became a member, strenuously opposed the Montagnards, and, although he consented to vacate his seat on June 2, 1793, could not avoid ultimate proscription. His Herculean strength enabled him to escape the officers who came to arrest him, and he took refuge with a friend. He reappeared in the assembly after the fall of Robespierre. In 1796 he became a member of the council of 500, to which he belonged for one year. Thenceforth he devoted himself to literary and philosophical pursuits, and gradually became religious. Among his publications were a pamphlet entitled *Proscription d'Isnard* (Paris, 1795), a declamatory but vivid picture of Robespierre's tyranny, and a lyrical poem of some merit, *Dithyrambe sur l'immortalité de l'âme*, dedicated to Pope Pius VII.

ISOCRATES, an Athenian rhetorician, born in Athens in 436 B. C., died in 338 B. C. His father, Theodorus, was a rich musical instrument maker of Athens, and gave his son the best education attainable in the city. Tisias, Gorgias, Theramenes, and Socrates were his teachers. His natural timidity and a weak voice prevented him from ever taking the part of a public orator, and he devoted himself to lecturing on rhetoric. He first taught in the island of Chios; but it is said that his success there was not very great, and that he was chiefly engaged in regulating the political constitution of the island. He then returned to Athens, where he soon had 100 pupils, at a charge of 1,000 drachmæ each. He also derived a considerable revenue from writing orations. Plutarch says that Nicocles, king of Cyprus, gave him 20 talents for his oration *Προς Νικοκλέα*. He was never willing to take part in public affairs, and, when appointed trierarch in 355, excused himself on account of illness. This refusal, considering his ample means, occasioned much ill will against him; and in 352, from policy, he accepted the position, and although it was the most expensive office which a private citizen could undertake, yet he fulfilled it with great liberality and splendor. Isocrates taught principally political oratory. The most eminent statesmen, orators, philosophers, and historians of the time were educated in his school, and he always selected practical subjects, proposing to them chiefly the political events of his own time as a study. His orations, though written to be delivered in his school, were copied and recited in all the coun-

tries inhabited by Greeks. In his *Areopagiticus* he urges Athens to adopt, as her only safeguard, the ancient democracy of Solon. In his *Panegyricus* he is equally warm in his exhortations to all the Greeks to unite against the barbarians. In his "Philip," an oration addressed to the king of Macedon, he entreats the king to unite with the Greeks, and lead them against the Persians. But Isocrates was not a practical statesman, and he was unconsciously urging Philip to become the ruler of the Grecian states, an object which Philip was then himself secretly planning. His *Panathenæicus*, a eulogy on Athens, was written when he was 94 years of age. After the victory of the Macedonians over his countrymen at Cheronea, he was unwilling to survive the destruction of their liberties, and destroyed himself. The writings of Isocrates were all carefully studied and elaborated; he is said indeed to have taken over 10 years to write his *Panegyricus*. They are remarkable for their flowing elegance and melody, the precisely turned sentences and periods making the style almost monotonous. Of 28 genuine orations of his, 21 have come down to us, 8 of which were written for judicial cases, and were intended to serve as models for forensic writing. Beside these, there are titles and fragments of 27 others, and also 10 letters, some of which are undoubtedly not genuine. His works have been translated into English by Sadlier, by Dinsdale, and by Gillies, and also into French, but unsuccessfully. The best text is Bekker's.

ISOMERISM (Gr. *ισος*, equal, and *μερος*, part), a term used in chemistry to express the relation existing between those substances which, while they possess the same ultimate composition, exhibit essentially different chemical and physical properties. The term isomeric is often applied indiscriminately to several classes of bodies which will here be separately considered. Strictly speaking, it ought perhaps now to be confined to those cases in which the elements composing the dissimilar substances are both quantitatively and qualitatively the same. Difference of properties can here be readily explained by admitting that the elements of the different bodies are arranged or grouped in different ways. For example: two chemically distinct compounds of mercury, oxygen, and sulphur are known, each of which contains in 100 parts equal quantities of these several ingredients, viz.: of mercury 80.65, of sulphur 6.45, and of oxygen 12.90 parts. Both have therefore the empirical formula Hg_2SO_4 . From the manner in which they comport themselves toward other substances, however, it has been ascertained that one must be regarded as basic sulphite of the protoxide of mercury, the rational formula of which is $(\text{HgO})_2\text{SO}_2$; the other a sulphate of the suboxide of mercury, of which the rational formula is $\text{Hg}_2\text{O}\cdot\text{SO}_4$. Similar instances abound, especially among organic bodies. Thus both formiate of ethyle and acetate of methyle—very different substances—have the

ultimate composition expressed by the formula $\text{C}_6\text{H}_8\text{O}_4$. They are however proximately composed of



That such compounds really contain different proximate constituents is proved by the fact that they afford different products when decomposed under similar conditions. Hence they are regarded as distinct chemical substances, and not as modifications of one and the same body. The different grouping of the elements of these compounds has been compared to that of letters in words like *ate*, *cat*, *tea*, &c., on the arrangement of which the meaning of the word is entirely dependent. All bodies which are thus isomeric with each other, all that have absolutely the same ultimate composition, must of course possess identical equivalent weights. Such substances are often called metameric (Gr. *μετα*, indicating change or alteration), in contradistinction to polymeric substances (Gr. *πολυς*, many), which are composed of similar elements united in the same relative proportion in each case, but in different absolute quantities; the equivalent weights in which these substances combine with other bodies being unlike. This distinguishes them from members of the preceding class, in which both the relative and absolute number of equivalents are the same. Very many polymeric substances are known, whole series of organic compounds being formed of them. As an example, olefiant gas and cetene both contain 85.7 per cent. of carbon and 14.3 per cent. of hydrogen. If nothing were known of their chemical comportment, the empirical formula CH would be applicable to both; but by studying their properties it has been found that 4C and 4H have united to form olefiant gas, the rational formula of which is therefore C_4H_4 , and its combining equivalent 28; while 32C and 32H have united to form cetene, which has consequently the rational formula $\text{C}_{32}\text{H}_{32}$, and the equivalent number 224. Between these two bodies there are 14 others polymeric with them and with each other. Differences like this have been compared to those between words like *ma*, *mamma*, *tar*, *tartar*, &c., which contain the same letters arranged in the same way, but in different quantities. The arrangement of the elements in polymeric substances is not however of necessity the same; thus, the ether of wood spirit is polymeric with common alcohol; yet the rational formula of the former is $\text{C}_2\text{H}_6\text{O}$; of the latter, $\text{C}_4\text{H}_{10}\text{O}$, HIO .—Until a comparatively recent period it was the prevalent opinion among chemists that bodies of similar composition must of necessity possess similar properties. Any observations tending to throw doubt upon the correctness of this belief were considered erroneous. Even the discovery, by Wöhler and Liebig, that cyanic and fulminic acids are of like percentage composition although they possess very different properties, was attributed to

errors of observation, and generally discredited. Faraday's investigation of several isomeric hydrocarbons in 1825 first proved the fallacy of this supposed law. Its exceptions, being now more carefully observed, were found to be very numerous. In 1830 Berzelius proposed that they should be classified as isomeric substances. It was however soon perceived that the doctrine of isomerism could not with propriety be employed to explain the cause of all the differences which had been observed; least of all, to explain those which occur among the elements themselves—bodies which, from his inability to decompose them, the chemist is forced to regard as simple. In 1840 Berzelius suggested that these peculiarities might depend upon some absolute difference of quality in the different varieties of a substance, and not upon any dissimilarity in the arrangement or number of its molecules. He proposed the term *allotropism* (Gr. *αλλοτροπος*, of a different nature) to express this idea, which has ever since steadily gained favor, although directly opposed to the doctrine of the immutability of matter, one of the principal tenets on which the chemistry of the first half of the present century was based. Allotropism is of special interest from the fact that several of the most common and best known elements may occur in two or more allotropic states. Thus, pure charcoal (lampblack), graphite, and the diamond are essentially identical chemical substances. They differ widely from each other, it is true, not only in their physical properties, but also in their chemical behavior toward other bodies. They can however be mutually converted into each other, excepting our inability to make artificial diamonds; the equivalent weight in which they unite with other substances is always the same;* and as a general rule, to which however many exceptions may yet be found, the bodies formed by such combination exhibit identical properties. It is admitted therefore that they are mere modifications of one and the same chemical substance, carbon. Again, the element phosphorus, as it commonly occurs, is a soft, waxy, yellowish white, exceedingly inflammable, and very poisonous substance, with a strong odor and taste, luminous in the dark, and readily soluble in bisulphide of carbon. It may easily be transformed, however, into another allotropic state, in which it is of a dark red, nearly black, color; is hard and brittle, devoid of taste or smell, and, so far as is known, of poisonous properties; is not luminous, and is completely insoluble in bisulphide of carbon. It differs moreover from ordinary phosphorus in specific gravity, and entirely in its affinity for other substances. Indeed, it is not known that it is itself combustible; for it may be heated without undergoing change to about 500° F., at which temperature it is reconverted into ordinary phosphorus. These two conditions of phosphorus are so ut-

terly unlike in all their properties, excepting the weight of their equivalent, that were it not in the power of chemists to prove their identity by converting them one into the other, they would without hesitation be considered distinct elements. Similar instances occur among gases. For example, ordinary oxygen gas may be converted into an allotropic modification called ozone, which possesses properties entirely different from those of the original oxygen. Chlorine gas also, according to Prof. J. W. Draper of New York, after exposure to strong sunlight, possesses the power of combining with hydrogen even in the dark, and exhibits other properties unlike those of chlorine which has been kept from the light. Several other elements are known to be capable of existing in two or more allotropic states; and a considerable number of compound bodies occur under different modifications, which, it is not unlikely, may yet be found to depend upon the allotropism of one or more of their elements. Indeed, these instances are so common that some chemists have been led to believe that most if not all of the elements may exist in distinct allotropic states. It has not as yet, however, been well ascertained to how great an extent the peculiar state of an element can influence the properties of the compounds it may form by uniting with other bodies. Schönbein, the discoverer of ozone, is confident that it exists, as such, chemically combined in several oxides. Other chemists have referred the dissimilar varieties of certain compounds of phosphorus, arsenic, &c., to the allotropism of their elements. Berzelius long ago pointed out that the different states of sulphide of mercury, iodide of mercury, &c., were probably to be attributed to a similar cause. Recently, Berthelot has advanced the opinion that the allotropic modifications of sulphur are intimately connected with, if not directly dependent upon, the electrical relation which this substance bears to the elements with which it is or has been united. When separated, by agents which are without action upon it, from those compounds in which it acts as an electro-positive body, as in sulphurous acid, it is amorphous and insoluble in bisulphide of carbon and other neutral solvents. On the contrary, when obtained from compounds in which it plays the part of an electro-negative element, as in sulphuretted hydrogen, it is susceptible of crystallization, and is soluble in bisulphide of carbon, &c. Berthelot also states that the modifications of selenium exhibit a similar comportment, and has suggested that the different states of phosphorus may in like manner represent respectively electro-negative (ordinary phosphorus) and electro-positive (red phosphorus) conditions. It is worthy of remark that these views, which are of prime importance in their bearing upon the theory of substitutions, are almost identically the same with those concerning chlorine published some years since by Prof. Draper. Although the correctness of the observations of both these chemists has been called in question

* Recent experiments of Brodie ("Quarterly Journal of the Chemical Society of London," Oct. 1859, page 261) cast serious doubt upon this commonly received notion.

by other observers, it cannot as yet be admitted that their views have been disproved; they still deserve the most careful consideration. The apparent relation between some of the phenomena of allotropism and those exhibited by substances when in the so called nascent state (a phrase used in reference to the well established fact that many bodies can be made to combine with other substances with much greater facility at the instant when they escape from some of their combinations than at any other time) has been remarked by several chemists. Intimately connected with this view is the theory of chemical polarity advanced by Brodie ("Philosophical Transactions," 1850, p. 759), who assumes that under certain conditions—as at the moment when a body enters into combination—a chemical difference exists between the particles of which the body is composed; so that these particles are to one another in a peculiar relation which is expressed by the terms positive and negative (+ and —). Several of the phenomena of allotropism may be explained by this theory. Thus, ozone may be regarded as polarized (active) oxygen, while ordinary oxygen is that in which the positive and negative particles are combined, and in the quiescent state. In like manner ordinary white and red phosphorus represent respectively polarized and indifferent conditions. It is customary to speak of the different allotropic states of a substance as if each were something absolute, and not liable to any variation. But there are numerous facts which go to prove that this is not always the case, and that the peculiar characteristics of the allotropic conditions of several bodies are themselves subject to certain variations. In support of this view may be instanced the great diversity of properties exhibited by different specimens of graphite and the various kinds of coke allied to it, or by the different sorts of sulphur.—In addition to the several classes of phenomena already alluded to, the peculiarities of which are strongly marked, there is another class of analogous facts which deserves mention. Many well known substances exhibit differences in hardness, color, specific gravity, solubility, &c., according to the circumstances in which they have been produced. Thus, carbonate of lime, when precipitated from a cold solution of a salt of lime, is readily soluble in an aqueous solution of chloride of ammonium; on the other hand, when in the form of marble it is scarcely at all soluble in this menstruum. Red oxide of mercury, which has been prepared by precipitation in the wet way, is decomposed with much greater facility when heated than that obtained by exposing nitrate of mercury to a high temperature. These differences, though subject to considerable variations, are rarely strongly marked. Since they do not affect to any great extent the chemical behavior of the substance, they are not classed as allotropic conditions, but are supposed to depend upon different states of aggregation of the substance.

Some of these variations are probably more intimately connected with allotropism than has heretofore been admitted; thus, the dissimilar properties exhibited by different specimens of silicic acid would now be attributed by most chemists to the known allotropism of its components. But most differences of this sort are so slight that they cannot be regarded as being dependent upon allotropism; they seem rather to be allied to those variations to which, as already stated, even the allotropic conditions of substances are themselves liable. It would appear indeed as if every substance, as well as each of its allotropic conditions, must have a point of maximum activity, at which point its properties are normal, subject however, like every thing else in nature, to perturbations by which its peculiar properties may be somewhat changed. In compound bodies it is not always easy to distinguish between allotropism and isomerism properly so called; indeed, both may occur at once, *i. e.*, both the arrangement and quality of the elements of two or more substances of the same ultimate composition may be unlike. There is also a large class of bodies to which the general term isomeric is still applied, some of which may be allotropic, while many are probably polymeric. As examples may be mentioned the numerous metallic oxides which undergo changes when heated. The very remarkable circumstance noticed in this connection, that these bodies while undergoing change give off a quantity of heat which they must have previously possessed in a combined or latent form, has led some chemists to seek for an explanation of all the phenomena of allotropism by assuming that heat is a material constituent of substances, capable of modifying their properties according as it is combined with them in greater or less quantity. This is however entirely matter of conjecture, and, in view of our limited knowledge respecting the true nature of heat, can hardly be admitted. Nor has the direct influence of heat been proved in all the cases of allotropism which have been studied. That it is nevertheless intimately connected in some way with these phenomena is evident. This is of special interest in view of the changes which heat is known to effect in the ordinary conditions of matter; the solid, liquid, and gaseous forms, which all substances are supposed to be capable of assuming, being unquestionably dependent upon the temperature to which they are exposed. These conditions must not however become confounded with those dependent on allotropism, which are essentially different. Other chemists have regarded allotropic modifications as dependent upon different states of aggregation of the hypothetical atoms of which, as they suppose, all bodies are formed. In their eyes, the chemical peculiarities of charcoal depend upon its amorphous state; those of the diamond are different because it is crystalline, and those of graphite unlike those of the diamond because its crystals belong to another system. They would call the ordinary state of

phosphorus crystalline, the other condition amorphous, and refer all differences of properties to this difference of form. Diversity of crystalline structure, or its entire absence, is however evidently only one of the many differences of properties incidental to allotropism; in many cases it must be regarded as a consequence of the latter, by no means as its cause. At all events, the cases of allotropism which occur among gases cannot be explained by this theory. Others, without paying special attention to crystalline form, have supposed that all cases of isomerism, taken in its widest meaning, depend upon variations in the grouping of the molecules of bodies. They even refer the instances which have here been classed under allotropism to differences in the arrangement of the particles of matter of which the elements themselves are composed. But few, however, now hold this opinion, the doctrine of allotropism being generally admitted. Although the mere term allotropism conveys no definite idea of the different conditions of matter which it indicates, and is, strictly speaking, nothing more than a convenient name for a class of phenomena as yet inexplicable, the fact which it denotes—that an element can exhibit the properties of two different substances—is of preëminent importance. At the present moment it is generally regarded as the greatest chemical discovery which has been made for years. Indeed, several important theories in this science have been materially changed by its recognition.

ISOMETRIC PROJECTION (Gr. *ισος*, equal, and *μετρον*, measure), a species of drawing, used chiefly by engineers, in which the perspective plane of the paper must be imagined as making equal angles with the three principal dimensions of the figure, and the eye at an infinite distance. Thus lines in the three principal directions will be drawn on the same scale, and that scale the same for all parts of each line.

ISOMORPHISM (Gr. *ισος*, equal, and *μορφη*, form), in chemistry, the property possessed by certain bodies, either elements, bases, or acids, of replacing each other in compounds without causing in these an essential change of crystalline form. The bodies that thus replace each other possess themselves similar forms, and are said to be isomorphous. Familiar examples of this mutual replacement in minerals are of the protoxides of iron and manganese, and of lime and magnesia. Chlorine, bromine, and iodine possess this relation toward each other; also arsenic and phosphorus, and the acids of these elements.

ISOTHERMALS, or ISOTHERMAL LINES (Gr. *ισος*, equal, and *θερμη*, heat), lines drawn upon the map of the world, connecting points of the same mean temperature—a method of representing to the eye the belts that possess the same amount of heat or cold, either at certain seasons or throughout the year. Humboldt first explained these lines in a paper published in the *Mémoires de la société d'Arcueil*, a translation of which appeared in the 3d volume of the

"Edinburgh Philosophical Journal" (1820), and in 1848 he published with Dove a map of the world upon which these lines were constructed. Lines along the points of mean annual temperature he called isothermals; those along the points of mean summer temperature, isotherals (Gr. *θερος*, summer); and those along the points of mean winter temperature, isochimicals (Gr. *χειμων*, winter). The singular results exhibited attracted the attention of other philosophers, and the subject has been further elucidated by the researches of Kämtz and Berghaus in Europe, and of various observers in the United States. Maps containing these lines for the whole year, and for the months of January and July, may conveniently be consulted in Nichols's "Cyclopædia of the Physical Sciences." They are from Dove's more complete maps made for every month. By these lines the surface of the earth is divided into zones, and those of corresponding temperatures on both sides of the equator are known as isothermal zones. The lines exhibit in a most striking manner how little dependent localities are upon their relative distances from the equator for the temperature of their climates. This is especially the case with the winter season in the northern hemisphere, and was perceived in the early settlement of the western coast of the Atlantic, where the cold was found to be equal to that of regions lying from 15° to 20° further N. on the eastern margin of the same ocean. The same thing is still more strikingly exemplified in the mean winter temperature of Edinburgh, which is 38½°, and of Kasan in the same latitude in the east of Russia, which is only 2°. But when the mean annual temperature of these two places is compared, the difference is reduced to only 10°, that of Edinburgh being 48°, and that of Kasan about 38°. The lines of different seasons are thus seen to be no more parallel with each other than any of them are with the lines of latitude. For all seasons in the northern hemisphere they are greatly contorted, while over the more oceanic southern hemisphere they pass more regularly in an E. and W. direction. The irregular distribution of land and water is the chief cause of these irregularities of temperature. Large bodies of the former in the polar regions, or lakes and seas that are covered during the winter with ice, send a chilly influence over adjoining countries, which spreads far into low latitudes; while oceanic currents flowing from equatorial regions carry with them into arctic latitudes a mild temperature, and render countries inhabitable, and even comfortable, which, situated so near the poles, would under other circumstances be buried in perpetual ice and snow. So in tropical climates high mountainous tracts, reaching to elevations above the snow lines, chill the surrounding atmosphere, and temper the climate of neighboring countries; while low sandy deserts in the same latitudes reflect the full heat of the sun, and give the maximum of atmospheric temperature. Thus it is that in the deserts of Mesopotamia, ac-

observed by Griffiths, during the land winds the thermometer has been seen to rise to 132° in the shade and to 156° in the sun; and thus it is that the isothermal lines of July circle around the interior portions of Africa, marking a mean temperature for that month of 90½°.

ISPAHAN (anc. *Aspadana*), a city of Persia, of which it was formerly the capital, situated in the province of Irak-Ajeme, 210 m. S. from Teheran, in lat. 32° 39' 34" N., long. 51° 44' 45" E.; pop. variously estimated by European travellers at from 60,000 to 200,000, the latter number being probably nearest the truth. It stands in the midst of a broad plain watered by the river Zendarood, which is here 600 feet wide. For miles around the city stretch groves, orchards, corn fields, vineyards, and shady avenues, interspersed with the ruins of deserted towns and palaces. On approaching the city from the south, travellers cross the river by three beautiful and massive bridges, which lead into spacious gardens watered by canals, and surrounded by numerous pleasure houses. A broad shaded avenue terminates in the great bazaar of Shah Abbas, an enormous length of building vaulted above to exclude heat but admit air and light. Hundreds of unoccupied shops line the sides of this once crowded mart of commerce, after traversing which for nearly two miles the traveller enters the great square of Ispahan, the magnificent *Maidan Shah*, an oblong open space 2,600 feet in length and 700 in breadth, with an area of upward of 40 acres. In the centre of two sides of this square are superb mosques, and in the centre of the other sides are great gates leading to the bazaars and to the royal mosque. Around the rest of the square are stately edifices of uniform architecture, once used as apartments for the nobility and officers of the Persian court, but now ruinous and desolate. In the S. part of the city is an extensive pleasure ground, called the *Chahar Bagh*, consisting of 8 gardens, or "paradises," as they were termed by the ancient Persians, watered by canals, basins, and fountains, adorned with palaces, and enclosed by lofty walls. The most sumptuous of these palaces is the *Chehel Sitton*, or "Forty Columns." The columns from which the name is derived are in the principal hall, and are inlaid with mirrors so as to resemble pillars of glass. The walls and roof are decorated with the same fragile material, interspersed with flowers of gold, the whole done with much taste, and so as to convey an impression of great magnificence. Behind this hall are many fine apartments, one of which is embellished with large paintings by native artists, representing the achievements of Nadir Shah and other Persian conquerors. Ispahan is distinguished even at the present day for the excellence of its manufactures, which consist of all kinds of woven fabrics, from the most costly gold brocade to the most ordinary calico or coarse cotton; of gold and silver trinkets, paper, pen cases, ornamental book covers, firearms, swords, glass, and earthenware. These

goods are sent to nearly all parts of Asia, Ispahan being a central emporium on the great line of traffic between Afghanistan, India, and China on the east, and Turkey, Egypt, and the Mediterranean on the west. The wine of Ispahan is thought not much inferior to that of Shiraz. The inhabitants are generally educated, so that almost every one can read and write, and even the shopkeepers and artisans are familiar with the works of the principal Persian poets. The merchants, who form a distinct class, are shrewd and enterprising, live in luxurious style in houses externally shabby, and many of them carry on business with large capitals, and on a scale that enables them to affect prices even in the markets of India.—On the S. side of the Zendarood is the Armenian suburb of Julfa, which is connected with Ispahan by a bridge 1,000 feet long, of 34 arches. It was founded about 1603 by Shah Abbas, who transported to it all the inhabitants of the Armenian town of Julfa on the Araxes, and gave them full toleration for their religion, and valuable privileges as merchants. This colony prospered for more than a century, and once contained 30,000 people and 24 churches. It is now greatly decayed, and has not more than 3,000 inhabitants.—Ispahan is a very ancient city, and is mentioned by historians as early as the 3d century. By the caliphs of Bagdad it was made the capital of their Persian provinces. Tamerlane captured it in 1387, massacred 70,000 of the inhabitants, and nearly ruined the city. It recovered at the beginning of the 17th century, and was the favorite abode of the monarchs of the Sooffee dynasty. In the height of its prosperity it was visited in 1673 by the French traveller Chardin, who resided there 4 years, and who describes it as a great city 24 miles in circuit, with 160 mosques, 48 colleges, 1,800 caravansaries, 273 public baths, and a population of 600,000. Other authors state the population at 1,100,000. But in 1722 it was taken by the Afghans after a siege of 8 months, and its buildings defaced and people massacred in frightful numbers. This catastrophe nearly destroyed the city. The seat of government was removed first to Shiraz, and afterward to Teheran, and for a century Ispahan was little more than a mass of ruins. It has been greatly improved within the last 30 years, chiefly by the exertions of Mohammed Hussein Khan, who was for a long time its governor. Still, the traveller rides for miles through deserted streets, ruined buildings, and silent squares.

ISRAEL. See JACOB.

ISRAELITES. See HEBREWS.

ISSAQUENA, a W. co. of Miss., bounded W. by the Mississippi river and S. E. by the Yazoo, which is navigable by steamboats; area, 965 sq. m.; pop. in 1850, 4,478, of whom 4,105 were slaves. It is drained by Sunflower river, and has a low and level surface, portions of which are often inundated. The soil is rich. The productions in 1850 were 143,130 bushels of Indian corn, 18,595 of sweet potatoes, and 8,461 bales of cotton. Capital, Tallula.

ISSUE. I. In law, used in deeds and wills to signify descendants. When employed in a deed, the term has a definite meaning. It is always construed to be a word of purchase, designating persons in being, and vesting in each of them an original interest. It cannot be a word of limitation, for that would confer on issue, whether in being or not, derivative interests devolved upon them through descent from the original taker; and such estates of inheritance can be created in deeds only by the word heirs. We have used the word purchase in its technical sense. In law, all estates are acquired either by purchase or by descent; and it therefore follows that all estates not acquired by descent, or by inheritance, are acquired by purchase.—The construction of the word issue in wills has involved much uncertainty and difficulty; for it is a term of the most extensive import. It may embrace all descendants to the remotest degree; or may be limited to immediate descendants, or confined to some particular class of descendants living at a given time. Of the rules of construction established by the discussion of this perhaps most vexed question in the whole range of legal learning, it must suffice to state only the most general. In a will, issue may be regarded as a word either of limitation or of purchase. If real estate be devised either directly to, or by way of executed trust for, a "person and his issue," the word is here taken to be one of limitation; and, as synonymous with heirs of the body, with which, indeed, it is interchangeably used in the statute *de donis*, it confers on the devisee an estate tail. Yet if it clearly appear from any expressions in the will that the testator did not intend to give such an estate, or that by issue he meant children, or any particular class of descendants, then the word will be construed as a word of purchase; and it will then comprise all who can claim as descendants from him to whose issue the bequest is made.—The different phrases which express default of issue have been the subjects of frequent and very nice construction. The failure of issue may be what is called a definite failure, when the will fixes a definite time for such failure, as if the devisee die "without issue living at the time of his death;" or it may be indefinite, when no period is fixed, but the contingency continues so long as the devisee has any descendants. A limitation over after a definite failure of issue is good; but not upon an indefinite failure, for the contingency is too remote. In the case therefore of a devise to A in fee, with remainder to another upon A's death without issue, the limitation over is void, and A's estate in fee is reduced to an estate tail. This is the general rule of the common law, though in the United States the courts seek to evade its authority, and often avail themselves of slight circumstances to support the executory devise. They have done so when the limitation was to the brother of A if the latter died without children; or to "survivors" when either of several devisees should die "without issue alive," or

"without lawful issue." In many of the states much of the difficulty is obviated by express statutory enactments. Thus in New York it is declared that when a remainder shall be limited to take effect on the death of any person without heirs, or heirs of his body, or without issue, the words heirs or issue shall be construed to mean heirs or issue living at the death of the person named as ancestor. The New York statutes abolish all distinctions between real and personal property in respect to contingent interests. The American cases generally follow the English common law rule in regard to limitations over upon the bequest of chattels; and, by confining the expression "without issue" to issue living at the death of the first taker, support executory devises. II. In pleading, the point or matter in contest between the parties to a suit. When in the course of their alternate pleadings the parties have reached a specific matter which one of them affirms but the other denies, they are said to be at issue, or, in the ancient language of the law, *ad exitum*, or at the end of their pleadings. An issue may be either of law or of fact. When a defendant demurs to the plaintiff's allegation, that is, denies its sufficiency as matter of law to support the plaintiff's action, he is said to tender an issue in law, and the other party is compelled to accept it. But if the defendant traverse the plaintiff's fact and propose to refer the matter disputed to some mode of trial, he tenders an issue of fact. The plaintiff may demur to the traverse or may join issue; indeed, he must do so when the issue is well tendered. An issue of fact is properly framed upon a direct negation or denial of an averment. Two affirmatives therefore do not make a good issue. For example, defendant pleads that A died seized in fee, and plaintiff replies that he died seized in tail. This is not good pleading, because the former allegation is not directly traversed, but is only argumentatively denied. Yet it is said two affirmatives may suffice when they are so contrary to each other that one of necessity denies the other. For similar reasons the issue must not rest on two negatives. As it is the object of the pleadings to reach the precise and essential subject for decision, it is of course necessary that they should develop some matter either of law or fact which, when decided, shall dispose of the whole controversy. They must therefore be directed not merely to the production of an issue, but to the production of one which is material. For issue joined upon an immaterial point, that is, a point not decisive of the right of the case, is fatally defective, and judgment upon any verdict found will be arrested by the court. Further, as in respect to any single subject of suit the decision of one material point may decide the action, it has become a rule that the pleadings shall tend not only to materiality, but also to singleness in the issue; in other words, no plea may allege several distinct matters, when any one of these would singly support the action. Finally, this single material

issue must be so particular in its character as to point out distinctly the nature of the matter in controversy. Upon the declaration the parties may join general or special issue; issues joined on later pleadings in the suit are called simply issues without other description. The general issue denies all the material allegations in the declaration, or rather it enables the defendant to demand proof of all of them. A special issue, properly speaking, is the denial of one of several substantive facts, which are essential to the right of action. A traverse of one essential point is plainly as complete a denial of the plaintiff's right of recovery, as the traverse of his whole declaration by a general issue could be. In practice the defendant has been allowed, upon the general issue, in many actions, not only to deny the material facts of the plaintiff's declaration, but also to put in particular matters of defence, which in strictness ought to have appeared in the form of a special plea. In England the abuses which grew up through this perversion of the general issue were repressed by statute, and the plea restricted to its original and proper intent. In the United States, however, very generally, the general issue may be pleaded in all cases, and admits any matter of defence in evidence. In some states notice of the special matter of discharge or avoidance intended to be offered at the trial, must be filed at the same time with the plea, or within a certain period afterward. An issue is informal when framed upon the artificial or improper traverse of a material allegation.—Feigned issues are sometimes framed in chancery for the purpose of submitting disputed questions of fact to the ordinary modes of trial at law. Thus, if it be contested whether A is the heir of B, the fact will be sent to be tried in a law court upon a fictitious suit. For example, one party may declare that he wagered with another that B was the heir of A; he then avers that he is so, and demands the wager. The defendant admits the wager, but avers in reply that B is not the heir of A. Upon these allegations issue is joined, and the fact is decided in the usual modes. Feigned issues may also be employed by suitors in courts of law for determining a single point directly and expeditiously.

ISSUS, a town of Cilicia, in Asia Minor, at the head of the gulf of Issus, celebrated for the battle fought near it in 333 B. C., in which Alexander the Great defeated Darius. Its exact site is uncertain, and the ruins of a Roman aqueduct, temple, and walls, which have been discovered in its vicinity, are probably the remains of ancient Nicopolis. The battle also between Septimius Severus and Niger (A. D. 194) was fought near Issus.

ISTAPA, or ISTAPAM, a port on the Pacific coast of Guatemala, in Central America, in lat. 13° 53' N., long. 90° 43' W., at the mouth of the river Michatoyat. Alvarado here built the vessels in which he sailed against Pizarro and Almagro in Peru, in 1533. From that time until 1853 it remained the only port of Guatemala

on that side of the continent. In the latter year it was abandoned for a point called San José, 12 m. N., which it was supposed suffered under fewer disadvantages. Both Istapa and San José, however, are entirely open to the sea, without protection of any kind, and vessels are unable to approach nearer than 1½ m. from the shore, where they are obliged to anchor on a bottom of shifting sands, prepared to stand out to sea at a moment's warning.

ISTHMIAN GAMES, one of the 4 great national festivals of Greece, celebrated on the isthmus of Corinth in April or May of every alternate year, in the 2d and 4th years of each Olympiad. The story of their origin is as follows: Athamas, king of Orchomenus, had by his second wife Ino a son named Melicertes, whom together with his mother he pursued in a fit of madness. In order to escape from him they jumped into the sea. Ino was changed into a sea goddess, and the body of Melicertes was washed ashore and buried by his uncle Sisyphus, who was directed by the nereids to pay him heroic honors under the name of Palæmon. Sisyphus accordingly established the Isthmian games in honor of Neptune and Palæmon. The games, however, were suffered to fall into disuse, and were for a time entirely interrupted, till Theseus organized them anew in honor of Neptune. In the 6th century B. C. they became Pan-Hellenic festivals. Until the overthrow of Corinth by the Roman general Mummius (146 B. C.), the games were conducted by the Corinthians, though the Athenians held the places of honor, the *προεδρία* or front seats. The privilege was then given to the people of Sicyon. After the rebuilding of Corinth by Caesar, they were again managed by that city, but the people of Sicyon had the exclusive right to sit as judges. They continued regularly till Christianity began to spread, when they fell into decay, but were still celebrated under Constantine and Julian. The Isthmian games, like the Olympic, consisted of all kinds of athletic sports, wrestling, boxing, gymnastics of every sort, racing on foot and in chariots, and also contests in music and poetry. The Romans added to them gladiatorial shows and fights of wild beasts, which were continued to the time of the final decay of the festival. The prize was a simple garland of pine leaves. Solon, in his legislation, ordered the sum of 100 drachmæ to be paid to any one who took a prize at the Isthmian games, and 500 to any one taking an Olympic prize.

ISTRIA (anc. *Istria* or *Histria*, from *Ister*, the Danube, an arm of which was early believed to flow into the Adriatic), a peninsula and margraveate of Austrian Illyria, on the N. E. coast of the Adriatic; area, 1,810 sq. m.; pop. 233,000. It is in general mountainous, particularly toward the N., where the surface is occupied by offsets of the Julian Alps. The coasts are irregular and indented by numerous good harbors. The soil is not remarkably fertile, but excellent olives, and grain, wine, lemons, silk, &c., are

produced. Sheep and cattle are extensively reared in the mountainous districts, and the coast fisheries and salt works employ a considerable number of the inhabitants. The chief towns are Capo d'Istria, Pirano, Isola, Rovigno, Pola, Dignano, and Pisino. The people of the towns are mostly Italians, and those of the rural districts of Slavic origin. In remote antiquity the Istrians were an Illyrian tribe, and were engaged in piratical enterprises, but prior to the second Punic war were reduced to submission by Roman consuls. They were again reduced by the consul Claudius Marcellus (183 B. C.) and the consul C. Claudius Pulcher (177 B. C.), and did not again revolt. Under Augustus Istria was incorporated as a portion of upper Italy. The most flourishing period of its ancient history was while the Roman government was fixed at Ravenna. It formed a separate *margraviate* in the 10th century, and was subject successively to the dukes of Carinthia and Dalmatia. The Italian part of Istria was held by the Venetians from the 13th century till 1797, the eastern part being incorporated with Carinthia and subject to Austria. Both portions were ceded to Napoleon I., and reconquered by Austria in 1813.

ISTURIZ, FRANCISCO XAVIER DE, a Spanish statesman, born in 1790 in Cadiz, where his father, a Biscayan merchant, had established an extensive house. After the fall of Joseph Bonaparte and the restoration of Ferdinand VII. those in Cadiz who were discontented with the rule of the latter were accustomed to meet in the house of the brothers Isturiz, which was known as the *Casa Otomana*. This was the head-quarters of the movement led by Riego (Jan. 1, 1820), "which made an anarchy of three years succeed a despotism of six." Xavier de Isturiz went to Madrid, where he aided in establishing liberal clubs; and having thereby placed himself in opposition to Arguelles and Martinez de la Rosa, who represented the moderate constitutionalists, he excited public opinion against them, especially after his election to the cortes in 1822. In 1823, as president of this body, he voted for the suspension of the royal power. Condemned to death after the restoration, he fled to London, where he was a partner in the mercantile house of Zulueta. Pardoned by the amnesty of the queen regent Maria Christina in 1834, he returned to Spain, where he at once engaged in democratic agitation and provoked the rising of the national guard, whose object was the overthrow of the minister Toreno, but which was suppressed by Quesada. Shortly after, his friend Mendizabal became prime minister, and made Isturiz his most intimate adviser. In Nov. 1835, he was appointed president of the chamber of *procuradores*, a sort of state council. The chamber proved too liberal, which caused a quarrel and a duel between Isturiz and Mendizabal. After the fall of the latter in 1836, Isturiz was appointed minister of foreign affairs and president of the council, but soon grew unpopular with all parties. The tumults of Aug.

1836, which resulted in the proclamation of the constitution of 1812, compelled him to take refuge a second time in England, whence he went to France. Having returned to Spain in 1838, he was elected to the cortes, and was its president in 1839. He negotiated the marriages of the young queen and her sister. In 1850 he was sent as minister to England, and in 1857 to Russia. On Jan. 5, 1858, he became president of the Spanish senate, and 10 days after president of the council, but was soon superseded.

ITACOLUMITE (from Itacolumi, a mountain of Brazil), a granular silicious rock, of laminated structure, found with talcose slates and more or less intermixed with tale or with mica. It is distinguished by its peculiar flexibility, sheets of it bending back and forth as if jointed within. It is of particular interest from its occurrence at the localities in the gold regions where diamonds are found. It is met with in Brazil, the Ural mountains, and in Georgia and North and South Carolina. In the last named state Mr. Lieber, the geologist, has observed the passage of the itacolumite into a true sandstone or even a conglomerate, proving its sedimentary origin.

ITALY, a large peninsula of southern Europe, extending from N. W. to S. E. in an elongated shape, which, being bifurcated at the southern extremity, has a certain similarity to the form of a high-heeled boot. The origin of the name Italy is differently explained by ancient writers. According to Timæus and Varro it is derived from *italos*, ox, meaning a country in which cattle abound; while Thucydides and Dionysius of Halicarnassus assume the existence of a mythical king named Italus, to whom the country owes its name. Italy is situated between lat. 36° and 47°, or if the islands are included, between 35° and 41° N., and between long. 6° and 19° E. Its length is about 600 m.; its breadth varies from 95 to 300 m. To the N. it is fastened, as it were, to the body of the European continent by the large knot of the great Alpine system, from which the Apennine range stretches along the entire length of the peninsula, forming (so to speak) its spine. On the E. the shores of Italy are washed by the Adriatic and Ionian seas, on the W. by the Mediterranean. Exclusive of the large islands of Sardinia and Sicily, which politically belong to Italy, the country has an area of 98,838 sq. m.; including them, 117,914 sq. m. The population of the peninsula and the lesser islands in 1859 was 23,144,767. Adding to this the population of the island of Sardinia (549,950) and of Sicily (2,231,000), we obtain a total of 25,925,717 inhabitants, distributed among 8 states, viz.: the kingdom of the Two Sicilies or Naples (41,521 sq. m.), Sardinia with Monaco and Lombardy (37,150), the Papal States (17,048), Venetia with Mantua and Peschiera (belonging to Austria, 9,241), Tuscany (8,712), Parma (2,184), Modena (2,073), and the diminutive republic of San Marino (21). The following statement shows the nationalities of which Italy is composed: Italians, 95.366 per cent.; French, 2.438; Friulians, 1.371; Albanians,

0.345; Jews, 0.160; Slavi, 0.116; Greeks, 0.091; Germans, 0.074; Spaniards, 0.033; Armenians, 0.004; gypsies, 0.002; total, 100.—The N. boundary of Italy is formed by the Alps, which under the different names of their several ranges sweep around the fertile plain of upper Italy in a semicircle from W. to E. Their descent toward the S. is steep and rugged, giving them the appearance of an immense natural barrier against Germany and France. The great northern plain, which extends at the base of the Alps nearly across the entire breadth of the peninsula, slopes gradually down toward the eastern shore, where its elevation is so small that in many places it needs to be protected from the tides by breakwaters and levees. The Apennines commence in the Maritime Alps with Mt. Appio, lat. $44^{\circ} 12' N.$; they take at first a direction to the N. E., then S. E., and at length S. W., crossing the strait of Messina into Sicily, where they are lost in the Mediterranean sea at Cape Passaro, lat. $36^{\circ} 50' N.$ Their average height is only 4,200 feet, though some peaks attain an elevation of 9,000 feet and over. (See APENNINES.) On either side of this central chain extend hilly regions and plains, forming a number of small river systems. Beside the great plain of Lombardy, which forms the river systems of the Po and Adige, that on the lower course of the Arno, the Campagna di Roma (including the Pontine marshes), and the Campagna Felice (near Naples), at the S. extremity of which Mt. Vesuvius towers up in a gigantic mass, deserve to be mentioned on the W. side of Italy. On the E. side the Apulian plain is the most extensive. It is 80 m. long and 30 m. broad. In ancient times one of the principal seats of Grecian civilization, it is now little better than a fertile solitude. The basin of the Sele is a plain extending about 28 m. from Salerno to the S. of Pastum; in its broadest part it is only 12 m. wide. The plain of Basilicata, nearly 100 m. long and from 2 to 24 m. broad, extends along the shore of the Ionian sea, and was formerly the seat of flourishing Greek colonies (Sybaris and Heraclea), but is now scantily settled, owing to the frequency of floods and its insalubrious climate. Italy has 4 distinct volcanic districts, viz.: the Euganean hills, between Padua and Este, rising in the Monte Venda to an elevation of 1,806 feet; the Roman volcanic district, extending from the hills of Albano to the frontier of Tuscany, and attaining a height of 5,794 feet (Monte Amiata); the Terra di Lavoro, including Mt. Vesuvius (3,949 feet); and the volcanic district of Apulia (highest elevation 4,357 feet). Mt. Etna in Sicily is likewise distinct from the Apennine range. (See ETNA.)—The soil of Italy, though of various quality, for the most part amply repays the labor of the husbandman, and is, in some sections where irrigation has been resorted to, of an exuberant fertility. It is a heavy loam, almost marshy in the plain of Lombardy, dry and poor in the hills, but fertile in the valleys. In the sterile Maremme (plains of S. W. Tuscany) and the Roman Campagna it ap-

proaches the character of the eastern steppes. In S. Italy the volcanic regions only are remarkable for their fertility.—Italy has but two rivers of importance, viz., the Po and the Adige. The former, with a length of 330 m., waters, with its tributaries (the Agogna, Ticino, Adda, Oglio, and Mincio on the left or N. bank, the Tanaro, Trebbia, Oreglio, Arda, Taro, Parma, Ena, and Secchia on the S. bank), a plain extending over 300 m. in length and 170 in breadth, being the greatest contiguous extent of highly fertile land in Europe. The Adige, descending from the Alps, flows in a semicircle to the E., falling into the Adriatic at no great distance from the Po. It is navigable only to a short distance above Verona. Nearly all the other rivers rising from the Apennines are mere mountain torrents, having a short course and no considerable depth; hence they afford very limited facilities to commerce. The most noted of them are the Brenta, Piave, and Tagliamento in upper Italy, the Arno in Tuscany, the Tiber in the Papal States (150 m. long, and navigable only from its mouth to the city of Rome, a distance of 15 m.), and the Garigliano, Volturno, and Silaro (Sele) in Naples. The mouths of most small rivers of S. Italy are surrounded with swamps, the noxious gases of which generate malaria and render the surrounding districts almost uninhabitable. Only Lombardy and Venetia possess artificial water courses of any importance. They were planned and constructed in the middle ages, more for the purpose of irrigation than of navigation, and belong to the oldest extant works of hydrostatics. Thus, the *naviglio grande* (great canal) was begun in 1178, the canal of Muzzo in 1220, that of Vettabbia in 1337, and that of Treviglio in 1350. A great number of mineral springs are found in all sections of the country. The most extensive lakes, several of which are celebrated for the picturesqueness of their surrounding scenery, belong to upper Italy. Lago Maggiore, 50 m. long and varying in breadth from 5 to 8 m., is the shallowest of all, having a depth not exceeding 25 feet; its surface is 750 feet above the level of the sea; it is fed by the river Ticino and 26 brooks. The lake of Lugano, 24 m. long and from $2\frac{1}{2}$ to 6 m. broad, situated 870 feet above the level of the Mediterranean, receives its waters from 43 rivulets, and discharges them partly by the river Tresa into Lago Maggiore, partly into the small lake of Piano. The lake of Como, 35 m. long, 3 m. broad, and of great depth, is fed by the river Adda and 195 smaller streams. Lake Iseo, 20 m. long and 6 m. broad, is chiefly supplied by the Oglio. Lake Garda, which belongs partly to the Tyrol, is the most extensive; it covers a surface of 315 sq. m., and is of sufficient depth to carry vessels of the greatest draught. Beside these, there are the lake of Castiglione in Tuscany, the lakes of Perugia, Bolseno, and Bracciano in the Papal States, and the lake of Celano in Naples.—The climate of Italy is generally considered the most genial and wholesome in all Europe, but proportionately to

the number of inhabitants the mortality is greater in Italy than in any other European country. The semi-tropical climate is not without its serious inconveniences. In summer for long months the burning heat, unrelieved by refreshing showers, withers all vegetation, parches the ground, and imparts to the landscape a gloomy brownish tint, which is any thing but agreeable to behold. In many places a subterranean heat periodically sends forth noxious gases. The lagoons and marshes which border the coast generate poisonous miasmata. Beside all this, legions of the most disgusting insects fill the air and visit the dwellings. Nevertheless, there are districts in Italy which, in regard to salubrity, compare favorably with any on the earth. In respect to its climate it may be divided into 4 regions. Of these, the first comprises upper Italy, N. of the Apennines, between lat. $46^{\circ} 30'$ and $43^{\circ} 30' N.$ There the temperature in winter is sometimes as low as $10^{\circ} F.$; the snow remains on the ground from 10 to 14 days; the lagoons on the Adriatic are frequently covered with ice; and though the mulberry tree and rice are raised to perfection, the more tender fruits of a southern climate ripen only in sheltered localities. Night frosts begin as early as November, and continue until March or April. Even in the summer months piercing cold N. winds are not uncommon. The 2d region, extending from lat. $43^{\circ} 30'$ to $41^{\circ} 30' N.$, is the region of the olive tree and orange. Frost and snow appear regularly only in the higher mountain districts, but occasionally snow may be seen even in the valleys and plains. The 3d region extends over $2\frac{1}{2}$ degrees of latitude, comprising nearly the whole continental portion of Naples. There the thermometer seldom falls below $26^{\circ} F.$; snow is very rarely seen except on the highest mountains, and never remains; aloe and other semi-tropical plants thrive even in unprotected localities. In the 4th region, comprising the southernmost part of the peninsula and the island of Sicily, the thermometer scarcely ever falls below the freezing point of water; snow and ice are unknown except on the summit of Mt. Etna; tropical fruits, dates, sugar cane, and the cotton plant thrive in the open air; aloe are so common that they are planted for hedge rows; a serene sky of the deepest blue spans the earth, and bracing sea breezes temper the heat. But at the same time this portion of Italy suffers often from the common drawbacks of tropical regions, droughts and hot winds (siroccos), equally obnoxious to human and vegetable life. Earthquakes and volcanic eruptions, causing sometimes an appalling loss of life, occur frequently in lower Italy and Sicily.—The principal productions of Italy belong to the vegetable kingdom. Its mineral wealth is very small. The precious metals, as well as copper, iron, lead, &c., are found in the mountain districts, but mining is so neglected that it furnishes a very insignificant part of the national resources. Alum is obtained in considerable quantities in the Papal States and in Naples, vitriol and antimony in Parma,

sulphur in Naples, statuary marble (the best known) near Verona and Carrara. Alabaster, agates, jasper, and garnets are also found in the Apennine range. Agriculture is the principal occupation of the inhabitants. Italy produces all kinds of grain, including rice and maize, pulse, millet, &c. Rye, oats, and barley are only raised in limited quantities, the principal breadstuffs being wheat for the wealthy classes, and maize for the poor. Lupines and chestnuts serve as a cheap substitute for grain, the potato having as yet been but partially introduced. Vegetables of all sorts are grown in great abundance, especially lettuce, asparagus, endive, artichokes, turnips, carrots, onions, garlic, melons, cucumbers, and tomatoes. The most luscious fruits grow with very little care, such as oranges, lemons, citrons, shaddocks, figs, almonds, carob beans, and dates. The sugar cane is cultivated in the southern portion of the peninsula and in Sicily, but its product is not equal to that of the cane of the West Indies. The cotton plant thrives well in Sicily, the annual product of which is from 1,750,000 to 2,000,000 lbs., all of which is spun and manufactured in the kingdom. Hemp and flax are grown everywhere in sufficient quantities for domestic consumption. The olive tree grows almost everywhere in Italy, and the oil obtained from its fruit is one of the principal articles of export. The tobacco culture is of no great importance. Saffron, safflower, and capers are exported. One of the principal products is silk, the export of which exceeds in value that of all other articles. Wine is produced in great quantities, but almost exclusively for home consumption. The grape is not as carefully cultivated as in other European countries, and it is probably in consequence of this that the wine has a somewhat acid earthy taste, which renders it unpalatable to foreigners. In the southern portion of the peninsula some qualities are produced equalling in body and flavor the most fiery Spanish and Greek wines.—The animal kingdom is not represented by many species in Italy. The domestic animals common to all Europe, including horses, cattle, sheep, swine, goats, asses, and mules, are likewise raised in Italy. Animal food being not as extensively used as in more northern countries, but little care is taken of the improvement of breeds. Swine are principally raised in Parma and the N. E. provinces of the Papal States, where the manufacture of sausages is carried on upon a large scale. The dairy products of Parma, especially cheese, are largely exported to foreign countries. The coast fishery employs a great amount of tonnage and capital. Tunny and anchovies are caught in immense numbers, and the latter exported to all parts of the world. Oysters are obtained from beds in the Adriatic, but are poor in quality. The sea furnishes also a great variety of smaller shell fish, which are used as food by the lower classes, or as delicacies by the wealthy.—The inhabitants of Italy are a mixture of many different races

who have successively obtained the mastery of the country. The Gallic (Celtic) and the Roman elements have in the course of time become the principal ingredients of Italian nationality, but few traces of the character of the aboriginal population being now discernible. In upper Italy the Germanic element has contributed its share toward the formation of Italian nationality. Even the name of Lombardy is derived from that of a German tribe. In southern Italy and Sicily the Arab element enters into the mixture of national characteristics. A common language is the principal bond of union of the Italian people, or, it would be more correct to say, of the educated classes; for only the written language is the same in all parts of Italy, while the vernacular of the common people consists of various dialects, almost as dissimilar as different tongues. It is only in a portion of Tuscany that the Italian language is spoken in its purity. In this respect Italy stands in a position similar to that of Germany. The unity of Italian like that of German nationality has, since the downfall of the Roman empire, never existed, and it is not until the present century that the idea of an Italy united politically has, at least among the educated classes, gone far to conquer the provincial and local jealousies and animosities through which Italy has for a long series of centuries become an easy prey to foreign conquerors. The Italian has generally a fine exterior. He is rather slim than stout, but strong and agile. A dark complexion, an expressive countenance, sparkling eyes, black hair, and a grave gait combine to render the *physique* of the Italian characteristic and prepossessing. A great proportion of the inhabitants retain many of the characteristics of the Roman conquerors of the world. The decline of the Italian military greatness was followed by eminence in letters. Italy was long the foremost nation of Europe in literature, art, and science, and has given birth to some of the greatest men of modern times. The prevailing system of agriculture, the peasants being obliged to pay one half of their gross income to the landlords, and the minute sub-division of the soil, exert a depressing effect upon the condition of the lower classes. Education has been long in a backward state, but the improved system recently introduced into Sardinia is beginning to attract the attention of the other Italian states. There are numerous high schools, academies, lyceums, and universities, and the last enjoyed during the middle ages a world-wide reputation, though they are now eclipsed by some of the German seats of learning. The universities of Italy are those of Bologna, Pavia, Salerno, Naples, Padua, Rome, Perugia, Pisa, Sienna, Turin, Parma, Florence, Catania, Cagliari, Genoa, and Modena. Immense literary treasures are stored in public libraries. The principal libraries are the Vatican and the Minerva library at Rome; the Borbonica and the Brancacciana at Naples; the university library at Bologna; the Ambrosian at Milan; the library of St. Mark at Venice; the royal library at Turin;

and the libraries at Brescia, Ferrara, and Parma. Literary and scientific societies have been numerous in Italy ever since the 14th century, but only a few of them have retained their vitality. Among them the *accademia della crusca* at Florence, the royal institute at Milan, and the academy of sciences at Turin, are the most prominent. Museums, cabinets of art, and picture galleries are found almost everywhere in Italy, rendering it the Mecca of artists. Observatories exist in Bologna, Padua, Milan, Florence, and Palermo. The number of charitable institutions of various kinds is enormous. The Roman Catholic religion is almost exclusively professed, all others being barely tolerated except in Sardinia, where freedom of religion is guaranteed by the constitution. The number of the clergy is remarkably large, the lowest estimate being 500,000.—The industry and commerce of Italy have fallen from the high state which they obtained during the middle ages, when the republics of upper Italy were the commercial centres of the continent, and held the same position which during the 17th century was held by the Netherlands, and since the 18th century has been held by Great Britain. Genoa and Leghorn, however, still retain an important influence in the shipping business of the world, and several branches of manufacture are in a flourishing state, such as those of silk, glass, earthenware, straw goods, artificial flowers, and maccaroni. The kingdom of Sardinia has a far greater length of railroads than all the rest of Italy. The aggregate length in the continental portion of Sardinia in 1856 was over 430 m., while Tuscany had only 146, Naples 36, and the Papal States 15. Since then, Lombardy having been annexed to Sardinia and several new roads having been constructed, the aggregate length of the Sardinian railroads is over 800 m. The shipping of Italy is large in the number of vessels, but small in tonnage. The following figures are given by O. Hübner (1859):

	Vessels.	Tons.
Papal States.....	1,842*	41,360
Sardinia.....	2,962	184,860
Naples.....	10,863	202,318
Sicily.....	2,081	47,428
Tuscany.....	940†	59,025

being an aggregate of 18,638 vessels, of which 2,435 are small craft, and 535,000 tons, or an average of nearly 29 tons to each vessel. The same authority furnishes the following statistics of the imports and exports of the principal Italian states:

	Imports.	Exports.
Papal States.....	\$10,080,000	\$9,864,000
Modena.....	1,440,000	2,088,000
Sardinia.....	63,360,000	46,800,000
The Two Sicilies.....	16,560,000	28,500,000
Tuscany.....	20,160,000	15,840,000

The principal articles of export are: from Piedmont, oil, oranges, wine, corals, silk, rice, fish, wood, hides; from Tuscany, oil, fish, silk, straw goods, marble, salt meat; from the Two Sicilies, oil, sulphur, sumach, almonds, lemons, grain,

* Including 1,674 small fishing vessels.

† Including 761 small vessels.

licorice, alcohol, wool, skins, silk; from Parma, silk, cattle, grain, cheese, wool; from Modena, wine, silk, fruit, marble, oil; from the Papal States, grain, wool, oil, beeswax, silk, cattle. The total value of the imports and exports in 1857 in round numbers was \$205,000,000. Those of the Austrian empire of the same year were estimated at \$250,000,000, a large proportion of which arose from the Italian trade. The tenacity with which Austria clung to her possessions in Italy is thus accounted for by the extraordinary benefits which she derived from them. The produce of silk alone represents a capital of \$40,000,000, and a much more immense capital after the silk has been manufactured in the silk factories of France, Switzerland, Germany, and Great Britain. The aggregate value of the total trade of all the Italian states in 1857 was estimated at nearly \$400,000,000. The bank note circulation of Italy, before the war of 1859, was \$8,600,000, the government paper currency \$4,400,000.—The political institutions of Italy appear to be at present (1860) in a state of transition. Until 1848 absolute monarchy existed in all Italian states. Since then constitutionalism has taken strong root in the Sardinian kingdom, it having become the policy of that state to hold up its liberal institutions as an incentive to the people of the adjoining states for the overthrow of foreign despotism. In upper Italy, where the remembrance of former municipal self-government still remained, the example of Sardinia exerted a powerful influence; and when, in consequence of the Franco-Sardinian war against Austria in 1859, the dukes of Parma, Modena, and Tuscany fled from their territories, provisional representative governments were established there, which, all things considered, worked admirably well. The following table exhibits the financial and military position of the different independent states before the late war:

States.	Expenditures.	Public debt.	Standing army (peace footing).	Navy.	
				Vessels.	Guns.
Papal States.	\$15,120,000	\$77,000,000	15,000	5	25
Modena	1,390,000		5,300	..	..
Parma	1,890,000	2,000,000	4,200	..	..
San Marino	5,000	..	*1,900	..	..
Sardinia	80,250,000	161,250,000	43,600	40	900
Two Sicilies	28,500,000	100,000,000	94,000	+107	912
Tuscany	6,156,000	13,650,000	14,000	10	15
Total	\$83,551,000	\$353,960,000	175,000	162	1,852

Since then, by the annexation of Lombardy to Sardinia, the peace establishment of the latter has been raised to some 80,000, and its public debt increased by \$65,000,000. The public debt of the duchies has likewise been increased about \$2,000,000.—The early history of Italy is closely connected with that of the Roman empire. Among the earliest inhabitants of the country we find the Etruscans or Tuscans, Umbrians, Oscans, Siculi or Latins, Volsci, Æqui, Sabines, Peligni, Marsi, Marrucini, Vestini, Hernici,

* Militia.

+ 19 steamers.

Ænotrians, Daunians or Apulians, Japyges, Peucetii, Messapii, and numerous other tribes, beside various Grecian colonies in the southern part or Magna Græcia. The name Italy, however, which replaced the Greek appellation of Hesperia or Hesperia Magna, was originally applied only to a small southern part, and gradually extended to more northern parts, until the time of Augustus, when it received its full extension, embracing the provinces of Liguria, Gallia Cisalpina, Venetia, and Istria, in the N.; Etruria, Umbria, Picenum, Samnium, Latium, and Campania, in the centre or Italy proper; and Apulia, Lucania, and Bruttium, in the S. or Magna Græcia. Poetically the country was also called Ænotria, Ausonia, Opica, Tyrrhenia, and Japygia, from various parts of the whole, and Saturnia, because Saturn was said to have once reigned over it. Augustus divided Italy into 11 regions, which division prevailed during the latter period of the history of Rome. Since the downfall of that empire the Italian peninsula has been the theatre of a political history which in its general features resembles that of the Germanic nations, being a continuous shifting of boundaries, an almost uninterrupted contest of dynasties, relieved by temporary successes of municipal self-government in the free cities of upper Italy, and by the brilliant development of literature and the fine arts. Odoacer, having dethroned the last Roman emperor, Romulus Augustulus (A.D. 476), assumed the title of king of Italy, but his reign was brief. In 493 he succumbed to Theodoric the Great, king of the Ostrogoths, and for a time the entire peninsula was united under Gothic dominion. The Byzantine generals Belisarius and Narses conquered it once more, and it was ruled by viceroys (exarchs) of the Byzantine emperors. In 568 the Longobards invaded Italy and established a powerful kingdom, the name of which has been preserved to this day for a small portion of its territory. They introduced Germanic feudal institutions, and thus completed the transition of Italy from the ancient forms of political and social life to those of the middle ages. Venice, founded by fugitives from the turmoil of the great migration of nations; the exarchate of Ravenna, reduced to a small portion of the present Papal States; Rome, and a portion of the coast districts of lower Italy (duchies of Amalfi and Gaëta), maintained their independence after having for some time remained in a nominal relation of vassalage to the Byzantine empire. During the latter half of the 8th century, the Longobards threatening Rome, which until then had been ruled by patricians, the aid of Pepin, king of the Franks, was invoked by the pope. Pepin, having conquered the exarchate, ceded it to the head of the church. Charlemagne, following up the victories of his father, subjected the Longobard kingdom (774) and annexed it to the Frankish empire. On Christmas eve, 800, Charlemagne was anointed by Pope Leo III. Roman emperor, and thus nominally the occidental empire was reestablished. Practically

that title, which was eagerly coveted for a long series of centuries by the rulers of Germany, was merely a pretext for territorial conquests in Italy. When, in 843, the empire of Charlemagne was divided among his grandsons, the Italian provinces fell to the share of Lothaire, but the rule of the Carolingians lasted scarcely for a generation. During a period of anarchy and civil war Guido of Spoleto, Berengarius of Friuli, Hugh of Provence, Berengarius of Ivrea, and Lothaire, son of Hugh, successively obtained an uncertain mastership. Lothaire having been poisoned in 950 by Berengarius, his widow Adelaide appealed to Otho I., king of Germany, who married her, conquered Lombardy (951), and in another campaign obtained the imperial crown. In lower Italy, the duchy of Benevento, and the republics of Naples, Gaëta, and Amalfi, though undisturbed by the strifes in the northern and central divisions of the peninsula, had for a long time to contend against the Saracens, who had conquered Sicily in 817, and invaded lower Italy during the latter half of the 9th century. Their attacks having at last been definitely repulsed, lower Italy once more returned under Byzantine rule, and remained so for nearly a century more, while the greater portion of Italy was held in subjection by Germany. For 50 years the German dominion was comparatively undisturbed. From the year 1000 the hatred of the Italians against the foreign rulers, diligently fostered by the clergy, manifested itself in frequent local insurrections and civil wars; but during the 11th century the German kings succeeded, on the whole, in maintaining their authority. During that time, in lower Italy, the Byzantine rule was gradually overturned by the Normans, who conquered Apulia and Calabria on the continent, and in 1070 the islands of Sicily and Malta from the Arabs. This new kingdom, consolidated by Robert Guiscard (1057-85) and Roger (1085-1114), became a strong point of support for the popes in their contests with the German kings. Their power increased so rapidly that the successor of the mightiest of all the German rulers over Italy (Henry III.) was compelled to submit himself to Gregory VII. in the most ignominious manner (1077). A new element then began to appear in the political development of upper Italy. The Lombard kingdom gradually resolved itself into several prosperous municipalities, some of which became in the course of continuous feuds powerful commonwealths, able to contend successfully even against the mighty Swabian (Hohenstaufen) dynasty of Germany. Milan, Venice, Pisa, and Genoa became the centres of the movement for national independence. Milan formed the league of the Lombard municipalities, which, allied with the popes, opposed the exertions of the Hohenstaufen to erect Italy into a hereditary kingdom for their own dynasty. The national party assumed the name of the Guelphs (from the Bavarian dynasty of the Welfs, the most powerful opponents of the imperial rule in Germany), while the partisans of the emperors

were known under the name of Ghibellines (a corrupt form of Waiblingen, the original seat of the Swabian or Hohenstaufen dynasty). A long continued struggle ended in the victory of the Guelphs, the emperor Frederic I. having been compelled to recognize the independence of the cities belonging to the league. As an offset to these reverses he obtained the kingdom of the Two Sicilies by the marriage of his son with the daughter of the last Norman king. When, by internal dissensions and bloody civil wars, the power of the free cities in upper Italy seemed to be exhausted, Frederic II. made another effort to obtain complete mastery, but his successes were only temporary (1248), and the German dynasty was completely overthrown in upper Italy (1254), while the kingdom of the Two Sicilies was wrested from them by Charles of Anjou. In the mean time municipal liberty in the free cities of upper and central Italy had been gradually subverted by petty dynasties, and the second half of the 13th century witnessed a long series of fierce party struggles, the old designations of Guelphs and Ghibellines being kept up, the former by the aristocratic, the latter by the popular or democratic party. The aristocracy was defeated in Venice, Genoa, and in Florence, whence all noblemen were banished (1282); but soon after the victorious popular party was torn into several hostile factions, and, though still able to frustrate the efforts of the German emperor Henry VII., who attempted to regain the dominion of Italy (1312), they succumbed in the different states to petty tyrants. Thus Pisa fell under the rule of Ugucione della Faggiola (1314), and Lucca under that of Castruccio Castracani (1316); Padua became a principality under the Carrara dynasty (1318), Alessandria, Tortona, and Cremona under the Viscontis, Mantua under the Gonzagas (1328), and Ferrara under the Estes. The Polenta family ruled in Ravenna, the Scala family in Verona, the Peyssoli family in Bologna (1335). Genoa expelled the leading families of the Guelph and Ghibelline parties, and elected its first doge, Simone Boccanegra (1339). In Rome the democratic party, led by Cola di Rienzi, was successful for a brief time (1347). Beside all the miseries engendered by these feuds and dissensions, armies of robbers, consisting of discharged soldiers, plundered the country, a terrible famine (1347) decimated the population, and a plague, the most horrible of which we have any account, mowed down full two thirds of the inhabitants of the peninsula. Yet in the midst of these afflictions, science, literature, and the fine arts flourished as they had never done before, and the very plague which made Italy a vast cemetery furnished the dark background on which Boccaccio drew the light fantastical pictures of his *Decamerone*. In lower Italy, Charles of Anjou, having lost the island of Sicily by a popular outbreak (the Sicilian vespers, March 30, 1282), consolidated his dynasty in Naples, and the country enjoyed comparative tranquillity. In 1382 Queen Joanna was dethroned and assassin-

ated. The usurper, Charles III., shared her fate in 1386, and her grandson maintained himself for 28 years. Toward the latter half of the 14th and during the 15th century 5 principal states arose above the wild turmoil of the preceding period, viz.: Naples, the Papal States, Florence, Milan, and Venice; while the smaller states gradually dwindled down to utter insignificance. From Milan the Visconti dynasty threatened all the neighboring princes, and gradually subjected Lombardy to their rule. Having become extinct in 1447, they were succeeded by the Sforza dynasty. In Florence, the Medici family rose by their wealth and prudence to monarchical power. Venice, under a strong oligarchical government, conquered Padua, Verona, Vicenza (1405), and a portion of Dalmatia (1426), established colonial governments in the Grecian archipelago and on the shores of the Black sea, and remained victorious in many struggles with the Turks and with Naples. Its former powerful rival, Genoa, had, after an almost continuous feud of 130 years (1250-1380), been compelled to acknowledge the superior power of Venice. After the end of the 15th century Italy became the theatre of the rivalry of the Spanish-Austrian dynasty and the French. The struggle was opened in 1497 by the attempt of Charles VIII. of France to conquer Naples. After many vicissitudes of war, the successes which France had obtained in Italy were finally annihilated by the battle of Pavia in 1525. From that time Italy enjoyed comparative peace for over 150 years, during which period its territorial and political relations became more and more consolidated. In Florence the Medici obtained hereditary monarchical power; the principality of Montferrat fell to the Gonzagas of Mantua (1536); Parma and Piacenza to the Farnese family, descendants of Pope Paul III.; Milan and Naples were secured to Spain by the emperor Charles V. (1553); in the extreme N. W. portion of Italy the ducal house of Savoy obtained Piedmont. Venice, whose resources had been greatly diminished by the discovery of the passage around the cape of Good Hope, lost the island of Candia in 1669, but conquered a large portion of the Grecian peninsula in 1684. New troubles and changes were caused by the wars of France under Louis XIV. Savoy and Piedmont were held by France for 21 years, from 1675 to 1696. In 1706 Austria conquered Milan, Mantua, and Montferrat, and ceded the last to Piedmont. By the peace of Utrecht Austria obtained Sardinia and Naples, but exchanged the former for Sicily, which had been given to Piedmont. The Farnese family having become extinct, Parma and Piacenza were given to the Spanish prince Charles in 1731, but fell to Austria in 1738, when Charles was transferred to the throne of Naples. In Tuscany the Medici family became extinct in 1737, and was succeeded by Francis Stephen of Lorraine, husband of the Austrian empress Maria Theresa. Parma and Piacenza were conquered by the Spanish prince Philip, and were con-

ferred upon him as a hereditary duchy by the peace of Aix la Chapelle (1748). Thus about the middle of the 18th century a large portion of Italy had lost its independence, being subject to the dynasties of Lorraine, Bourbon, and Savoy. The republics of Genoa and Venice were mere shadows of what they had been in former times. The political and social life of the country settled deeper and deeper into the slough of apathy and moral degradation, over which the flames kindled by the French revolution cast a lurid glare. In 1792 a French army invaded Savoy, which, after several campaigns, was annexed to France (1796). In 1797 Bonaparte erected Milan, Mantua, a portion of Parma, and Modena into the Cisalpine republic; Genoa was transformed into the Ligurian republic, and the Papal States into the Roman republic (1798). Naples, having sided with Austria, was invaded by the French, the king Ferdinand IV. expelled, and his kingdom formed into the Parthenopean republic (1799). During Bonaparte's campaign in Egypt the allied Austrians and Russians reconquered upper Italy, and the British, Russians, and Turks lower Italy; but in a brief campaign Bonaparte restored the French supremacy (1800). By the peace of Lunéville the duke of Parma obtained Tuscany under the designation of the Etrurian kingdom; Lombardy and Parma fell to France, and Venice to Austria. In 1802 the Cisalpine was changed into the Italian republic, under the presidency of Bonaparte, and in 1805 into the Italian kingdom, administered by Napoleon's stepson Eugene Beauharnais. Guastalla was annexed to the new kingdom, and Piombino and Lucca were given in fief to Napoleon's sister, Elisa Bacciochi. By the peace of Presburg Venice, Istria, and Dalmatia were added to the Italian kingdom, the area of which then comprised 35,400 square miles, with a population of 5,657,000. In the following year Guastalla, the Ligurian republic, Parma, and Piacenza were completely annexed to France, while Naples was once more made a kingdom for Joseph Bonaparte, who was succeeded by Murat in 1808. In that year the Etrurian kingdom and the Papal States were added to France, but Istria and Dalmatia were separated from Italy and united to the new Illyrian kingdom, while a portion of the Tyrol was added to Italy. The last effort of Austria to crush the French in Italy having been frustrated in a 5 days' battle (April 19-23, 1809), the supremacy of Napoleon in Italy remained undisturbed until his power had been broken by the Russian campaign and the successful rising of Germany. Murat of Naples made common cause with Austria (Jan. 11, 1814), and the French army was expelled from Italy (April 23, 1814). Murat, who was to have been confirmed in the possession of Naples for the support lent to the enemies of his benefactor, was dethroned by a counter-revolutionary movement, and in an attempt to reconquer his kingdom died by sentence of a court martial. Under the new territorial arrangements of the congress of Vienna, the

king of Sardinia was reinstated in his former possessions, to which Genoa was added; the Lombardo-Venetian kingdom was given to Austria; Modena, Mirandola, Reggio, Massa, and Carrara were transferred to the dynasty of Hapsburg-Este; in Tuscany the Hapsburg-Lorraine dynasty was restored; Parma, Piacenza, and Guastalla fell to the empress Maria Louisa, wife of Napoleon; Lucca to the Bourbon princess Maria Louisa; the Papal States and the kingdom of the Two Sicilies were restored to their former rulers; and Malta, Gozzo, and Comino remained in the hands of England. The republic of San Marino and the petty principality of Monaco had been undisturbed through all these chaotic changes of possession.—The wishes of the advocates of national unity, independence, and constitutional liberty having been baffled by the simple restoration of the ante-revolutionary institutions, dissatisfaction and hatred of the foreign rulers engendered conspiracies and secret societies, whose extent and power increased in the same ratio as the restrictive measures adopted against the people. In 1820 and 1821 revolutionary outbreaks occurred in Naples and Sardinia, and the rulers of these states were compelled to promise measures of reform; but the congress of Laybach ordered the suppression of these movements, and the complete subjugation of the revolutionary party by the Austrian armies was followed by a long period of reaction and vindictive persecution. The government of Tuscany was at that time comparatively liberal, and continued so until Sardinia assumed the lead of the liberal aspirations of Italy (since 1848). In Feb. 1831, new popular risings took place in Parma, Modena, and the Papal States, but were again suppressed by Austrian armies. In the following year the Romagna made another effort to throw off the papal rule, in consequence of which an Austrian army crossed the frontier, while a French army of occupation, in spite of the protest of the pope, occupied and held Ancona until 1838. The political state of Italy remained tranquil to the superficial observer, but violent outbreaks from time to time proved the existence of a strong feeling of dissatisfaction, which was nourished and fostered by secret organizations, such as the *Giovine Italia* (young Italy), and by men like Mazzini, who began his career as a political agitator as early as 1831. A new era seemed to dawn upon Italy when Pope Gregory XVI. died (June 1, 1846), and was succeeded by Pius IX. He inaugurated a series of moderately liberal reforms, and was hailed as the political saviour of his country. Tuscany and Sardinia followed the example set by the pope, and a customs union was effected between the 3 states (1847). Partial liberty of the press and popular representation were conceded or promised. About that time the principality of Lucca was united with Tuscany, and the reigning family of the former obtained the duchy of Parma (the empress Maria Louisa having died), according to the stipulations of the treaty of Vienna. Sicily rose, in Jan. 1848, against the king of Naples,

and declared its independence. The king, in order to reconcile his subjects, gave them a liberal constitution, which, however, was soon broken. In upper Italy the French revolution of February became the signal for a popular rising against the Austrian rule. Radetzky, the commander of the Austrian army, was compelled to relinquish Lombardy and fall back on Verona. The king of Sardinia, Charles Albert, took the lead in the struggle, occupied Lombardy, and seemed in a fair way to conquer Venice; but two brilliant victories of Radetzky turned the scale against the popular cause, and the Austrian rule was re-established. Venice, however, withstood; Rome (whence the pope had fled, Nov. 24) and the duchies were republicanized; and, encouraged by the reverses of the Austrians in Hungary, the king of Sardinia once more ventured to measure swords with Radetzky. But in a brief campaign (March, 1849) he was utterly routed, and the very existence of the Sardinian kingdom seemed to depend upon the good grace of the Austrian general. The duchies were restored to their former rulers, and guarded by Austrian troops. Rome, after an obstinate defence under Garibaldi and others, was resubjected to the pope by a French army of occupation, which has remained there for over 10 years. Venice surrendered in Aug. 1849. While in Naples, Modena, and the Papal States severe reactionary measures followed the overthrow of the popular movement, the new king of Sardinia, Victor Emanuel, fostered liberal institutions, and the Austrian government sought to reconcile the people of Lombardy and Venetia by conferring upon them some material benefits, such as the construction of railroads, the improvement of the port of Venice, reforms in the tariff and the postal system, &c. But all these efforts proved unavailing to overcome the national antipathies of the people, and on Feb. 6, 1853, an insurrection broke out at Milan which was suppressed without great effort. In 1857 an unsuccessful attempt to overthrow the king of Naples was made by a small band of republicans, led by Col. Pisacane; and about the same time a republican insurrection occurred at Genoa. The fact that Pisacane had made his attempt on board a Sardinian steamer which he had forcibly taken possession of, and which was afterward seized by the Neapolitan government, gave rise to an acrimonious correspondence between Sardinia and Naples; and in 1858 a war seemed imminent on that account, but was averted by timely intercession. In consequence of Orsini's attempt on the life of the French emperor (Jan. 14, 1858), a special law, directed against all "suspected individuals," was enacted in Sardinia, and this fact was considered as a significant symptom of the intimate relations existing between France and Sardinia. Austria at that time began to suspect the intentions of her neighbors, and by a series of liberal measures and promises endeavored to strengthen her foothold in Lombardy (July, 1858). Simultaneously she tried to form an Italian league; but, though

Modena and Naples were willing to enter into all Austrian projects, the duchess of Parma and the grand duke of Tuscany declined. When, in Aug. 1858, it became known that Sardinia had ceded to Russia a locality suitable for a navy yard at Villafranca, and that Russia had sought to purchase the principality of Monaco and applied to the king of Naples for the cession of a naval depot at Brindisi, the opinion became general that a triple alliance, directed against Austria, was on the point of being concluded. This opinion obtained further strength when Prince Napoleon sought a matrimonial alliance with the daughter of the king of Sardinia. On New Year's day, 1859, a few words spoken by the French emperor to the Austrian ambassador dispelled all doubts in regard to his hostile intentions. While the preparations for war on both sides were going on, the people of Italy became assured that it was not a change of foreign supremacy but really the liberation and national organization of Italy which the French emperor intended to accomplish. Dreading the approach of a revolution, the king of Naples set free many prominent political prisoners. On April 21 the Austrian general Gyulai sent an ultimatum to the king of Sardinia, and crossed the Ticino in 3 columns, April 26-29. The duke of Modena, the duchess of Parma, and the grand duke of Tuscany, unable to make head against a popular rising, quitted their states—the duke of Modena taking his political prisoners along with him, and transferring them to the dungeons of the Austrian fortress of Verona. For nearly a month no open hostilities occurred, the Austrians contenting themselves with plundering the rich province of Lomellina. Their left wing having been defeated near Montebello (May 20), and the enemy being on the point of outflanking their right wing (battles of Palestro, May 31 and June 1), they recrossed the Ticino and were routed in a great open battle near Magenta (June 4). The consequence of this defeat was the relinquishment by the Austrians of Milan and the entire N. W. portion of Lombardy, which in the mean time had been invaded by Garibaldi. Without risking a defence of the lines of the Adda and Oglio rivers, they retreated to the line of the Mincio. There, in the great battle of Solferino, they were defeated (June 24), but under circumstances which made it appear doubtful whether the French would be able successfully to contend with them on the ground of their famous quadrilateral of fortresses. Considering this, as well as the threatening attitude of Prussia, the French emperor, to the surprise of all Europe, suddenly concluded a truce, which was immediately followed by a personal interview between the two emperors (July 11) at Villafranca. There the preliminaries of a peace were arranged, by which a portion of Lombardy, exclusive of the important fortresses of Mantua and Peschiera, was ceded to Sardinia, which had to pay for this conquest a sum of \$42,000,000. Venice was confirmed to Austria. The restoration of the

grand duke of Tuscany and the duke of Modena was stipulated for, the question about Parma being left open. A promise was held out to Italy of the formation of an Italian confederation under the honorary presidency of the pope. Intense discontent arose in Italy when these stipulations became known. The people of the duchies and likewise of the Romagna (the insurrection in the other provinces of the Papal States had been quelled by the mercenary troops, principally at Perugia, June 20) united in their protestations against the restoration of their former rulers. They solemnly transferred their allegiance to the king of Sardinia, but he thought best still to refuse the crown proffered to him, and to substitute Signor Buoncompagni for the prince of Carignan, to whom the regency was subsequently offered. The peace was signed at Zurich in accordance with the original stipulations of Villafranca, Nov. 10. The final settlement of the affairs of the duchies was to be effected by a European congress, the meeting of which was expected to take place in Jan. 1860. This, however, was delayed or prevented by more recent diplomatic developments. A few weeks before the time fixed upon for the meeting of the congress, a pamphlet entitled "The Pope and the Congress" was published in Paris, which, though bearing the name of M. de la Guerrenière as author, was generally understood to have been written by the French emperor or under his direction. Its leading doctrine was that the revolted Papal States should not be forced to return to their allegiance, and that the pope must be restricted as a temporal sovereign to a very small territory and to limited authority. This was followed by a letter from the emperor to the pope, in which he said: "What appears to me most in accordance with the true interests of the holy see is to make a sacrifice of the revolted provinces. If the holy father, for the repose of Europe, were to renounce those provinces, which for the last 50 years have caused so much embarrassment to his government, and were in exchange to demand from the powers that they should guaranty him the possession of the remainder, I do not doubt of the immediate restoration of peace." The pope in reply to these suggestions declared that he would suffer exile and martyrdom before he would relinquish the authority of the holy see over the revolted provinces. By a diplomatic arrangement between France and England it has been recently proposed that the duchies and the Romagna should be united to Sardinia as an integral part of that kingdom, in case their inhabitants, to whom the question was to be submitted, should vote for annexation. (For further details of the recent history of Italy, see *SARDINIA*.)—The principal travellers in Italy who have given accounts of their tours in letters, journals, or more elaborate works, are Montaigne, Evelyn, Gray, Smollett, Dr. Moore, Goethe, Joseph Forsyth, Mme. de Staël ("Corinne"), J. C. Estuace, Henry Matthews, Lady Morgan, Miss Eaton, Wm. S. Rose, Hans Chr. Andersen ("The Im-

provisatore"), Mrs. Kemble, Wm. Spalding, and Geo. S. Hillard. Murray's three guide books through Italy are also of the highest merit. The most important historical works are those of Guicciardini (1561); Muratori (1744-'9); Bossi (1819); Botta, *Storia d'Italia dal 1789 al 1814* (Paris, 1824), and *Storia d'Italia dal 1490 al 1814* (Paris, 1832); Lebrét, *Geschichte von Italien* (1778-'87); Leo, *Geschichte der Italienischen Staaten* (1829-'32); Reumont, *Beiträge zur Italienischen Geschichte* (1853-'7); Fantin Des Odoards, *Histoire d'Italie* (1802-'3); and Sismondi, *Histoire des républiques Italiennes du moyen âge* (1809-'18). Among the historians of recent events are R. H. Wrightson, "History of Modern Italy from the French Revolution to 1850" (London); Gualterio, *Gli ultimi rivolgimenti Italiani* (2 vols., Florence, 1850-'51); Ranalli, *Gli avvenimenti d'Italia dopo l'esaltazione di Pio IX.* (Florence, 1852); Perrens, *Deux ans de révolution en Italie*, 1848-'9 (Paris, 1857); and Rüstow, *Der Italienische Krieg von 1859* (Zürich, 1859).

ITALY, LANGUAGE AND LITERATURE OF. Ancient Italy is supposed by Giuseppe Miceli (*L'Italia avanti il dominio dei Romani*, Florence, 1810) to have had a common language of many dialects. These consisted of two branches, the Etruscan and Umbrian, of which the Iguvian is the best known specimen, and the Sabine with the Samnian and Oscan, including the Volscian, Marsian, and Hernician. Greek was spoken in the south (Magna Græcia), especially at Tarentum and in other maritime cities. The Pelasgian Siculi of the low lands about the Tiber were partly driven out to Sicily, and partly mixed with the conquering Osci from the Abruzzi, with whom they formed the Latins. Rome imposed her own idiom upon all the inhabitants of the peninsula, by destroying their monuments, and establishing military colonies in their cities. Notwithstanding this, Livy attests that the Etruscan continued to be spoken for centuries; according to Anlus Gellius, it was used even in his own time, the middle of the 2d century A. D. Mazochi ascribes the extinction of the Oscan, in the south, to the epoch of the *lex Julia* (1st century B. C.). Celtic was also spoken about Bologna and generally in Cisalpine Gaul, until the Gothic invasion; so that O. M. Toselli (*Origine della lingua Italiana*, Bologna, 1831) asserts that it has a greater share in the Italian than the Latin itself. That which is common in all these dialects is the heirloom of the Indo-European stem; while that in which they differ either belongs to other stems of languages, or is of later origin.—There are 3 theories concerning the origin of the Italian language. 1. Leonardo Bruni (15th century), Cardinal Bembo (*Prose, nelle quali si ragiona della volgare lingua*, Venice, 1525), Saverio Quadrio, &c., assert that it is as ancient as the Latin; that both were used in Rome, the Latin in public speeches, in legal documents, and by the learned, while the *Romana rustica* was spoken by the

people and in private conversation. The Latin, having been Grecized, became, so to speak, stereotyped and sterile, and died away with the aristocracy; whereas the vulgar speech, carelessly spoken, and poor in grammatical forms, continued to live. Many such vulgar expressions are found in Ennius, Pacuvius, and especially in the mouth of the low characters in the plays of Plautus, Terence, &c., in the *Scriptores Historiæ Augustæ*, the writings of Tertullian, and other ecclesiastical as well as secular authors of the declining period of Rome. Such words are: *aramen*, instead of *as*, whence *rame*, copper; *botulus*, for *intestinum*, whence *budello*, bowel, sausage; *cambire*, for *dare mutuo pro*, whence *cambiare*, to exchange; *batuere*, for *percutere*, Ital. *battere*; *equallus* for *equus*, Ital. *cavallo*; *bellus* (*pulcher*), *vernus* (*hiems, hibernus*), *casare* (*vacillare*), *lactamen* (*fimus*), *orbus* (*cæcus*), whence *bello*, *interno*, *cansare*, *letame*, *orbo*, &c. 2. Muratori (*Antiquitates Italiæ Medii ævi*, Milan, 1738; *Dissertazioni sopra le antichità*, &c., 1751) maintains that the primitive languages, continuing to subsist in spite of proscriptions, were altered by time, and concurred with the Latin to form the basis of the Italian. Fontanini, Tiraboschi, Denina, Ginguenè (*Histoire littéraire d'Italie*), Sismondi (*Histoire des républiques Italiennes du moyen âge*), &c., agree with this view. Barbarous terms and phrases, exotic pronunciation, and ignorance of letters were rapidly altering the language of the Romans; and the *disjecta membra* of many tongues at last combined in one, not only in Italy, but over all those portions of the great empire which are the area of the 6 or 7 Romanic languages. 3. Scipio Maffei (*Ierona illustrata*) holds the opinion that the Italian arose merely by the corruption of Latin, without any agency of foreign tongues. Vulgar terms, incorrect forms, perverted significations, and vicious pronunciation, had been corrupting the Latin before the invasion of the barbarians. But his vouchers, taken from Anlus Gellius, St. Jerome, and other writers of this kind, show the effects of foreign influence at Rome. Isidore of Seville, in the 7th century, who speaks of the *lingua Italica*, says that each nation introduced its vices in words and morals into the empire. Ciampi traces the use of the language to the 5th century. Gonzo (about 960) attests its use among the better educated portion of the inhabitants; and Wittekind mentions that the emperor Otho I. (936-'73) spoke both the *lingua Romana* and the *lingua Slavonica*. Pope Gregory V. (996) instructed the people in the same. The opinion, therefore, that the Italian was formed as late as the 11th century, is groundless. Muratori has published many Italian documents mixed with Latin ones of the years 1153, '70, '82, &c. At the poetic court of the emperor Frederic II. (1212-'50) the language was called *Siciliana*, and the oldest authentic specimen of it is a rude, scarcely intelligible song by Ciuilo d'Alcamo, of about 1195. The Siennese idiom of Folcachiero, of

somewhat later date, is more chaste. In the 13th century the Italian improved rapidly in pliability, elegance, and soon also in regularity, so that in grammar and lexicology it approached in the 14th very much the form it has now. With the exception of the Icelandic, all other modern European languages were yet in their infancy. Dante did most of all toward developing and consolidating the native elements, in legitimizing the exotic accessions, and in polishing the whole language, which he calls *illustre*. He says that posterity will not be able to change it. Petrarch (died 1374) and Boccaccio (1375) rendered Dante's idiom more mellow and popular; the former by imparting to it the polished suppleness of the Provençal, the latter by emboldening it to express all shades of thought. There is no old Italian, in the sense of the old French; for the ante-Dante only differs in form from the idiom which he created. The Bolognese also soon became distinguished. *Il tesoro dei rustici, poema di Paganino Bonafede*, Bolognese, in *rozzo* (rough) Italian, is of 1360, and ends thus:

Or tutte le cose, che qui son ditte,
E che son qui notate e scritte,
Tutte, quante son certe e proate
E corette e regulate
Per Paganin de bona fe,
Che le compose e disse e fo
Per ammastrare quelli che inen sano,
Da lui se tanto saver vorano.

Little was done in promoting the language in the 15th century, but the 16th endowed it with choice terms of art, in consequence of antiquarian researches. Romolo Amasio, professor at Bologna (1523-34), in a speech before Pope Clement VII., insisted that the Italian ought to be confined to the peasantry and the market place, to make room for the Latin in higher spheres. Nicolo Macchiavelli (1469-1527) was the father of Italian prose. Pietro Bembo (died 1547), Giovanni Rucellai (1526), Jacopo Sannazaro (1530), G. G. Trissino (1550), Ariosto, Tasso, Guarini, &c., raised it above all other European languages. Aug. Beolco di Ruzzante (Venice, 1565) wrote 6 comedies, in which each person speaks his native dialect; a method analogous to the use of Prærit in Indian dramas. Benedetto Varchi (*L'Ercolano*, &c., Florence, 1570) reformed the orthography and established the grammar. Grazzini with Leonardo Salviati founded, in the *accademia della crusca* at Florence, a tribunal of the language (1582). The influence of French on European languages during the 17th century began to be exerted on the Italian, especially on its syntax. Algarotti was the chief fosterer of this influence. But Monti (*Correzioni al vocabolario della crusca*, and in other works) and Perticari strenuously and successfully resisted this denationalization, and restored to their cherished tongue the glorious direction imparted to it in the 14th century.—The following details relate to the *illustre favella* of Dante, unless a dialect be mentioned. The comparative harmony of intonation of the Italian and Spanish languages is a matter of individual preference. We place the Italian first with re-

spect to music, but prefer the Spanish as to the *numerus* or euphony of speech. Only 5 Italian words end in consonants (3 liquids), viz.: *il, in, con, non, per*. By dropping *e* and *o* after liquids only, other words are made to end in them, thus: *parlarono*, or *parlaron*, dropping *n*, *parlato*, also *parlar*, which is also the infinitive (from *parlare*) or the negative imperative. Too many words end in *i* (plural from *e*, *o*, and from *a* masculine, and 2d person singular of verbs); for instance: *Sapete, amici miei, che tutti i celebri poeti Italiani sieno stati colmi di allori ed onori, nei secoli passati*. The sound of *h* exists only in the *lingua Toscana*. The Spanish has only one rough sibilant *ch* (as in our *church*), whereas the Italian has this, written *ce, ci*, as well as the sound of our *sh* (in *ship*), written *sce, sci*; moreover, *ge, gi* (as in English *gem*), the double consonant *ts* (written as in German, *z*), which supplants the melting sound of the Latin *tia, tiè, tio*, as in *tristezza, pazienza, nazione* (for *tristitia, patientia, natio*), &c. *Oggi, fuggire, uccidere*, and the like, exaggerate the harshness by a preceding sound of *d* and *t*. The ratio of initial and medial consonants to the vowels is as 2 to 1 in Latin, while they are about equal in number in Italian. Beside the above mentioned sounds, there are *b, d, f, l, m, n, p, q, r*, as in English; *c* like *k* in the same positions as in English; so also *g* hard (written *ch, gh*, before *e, i*); *j* medial sound, like our *y* in *yes*, but as final it is a long *i*; *r* always rolling; *t* always hard (in old writings also like *z*); *s* as in English *sum, rose*, never as in *vision, mission*. The letters *k, w, x*, and *y* are not used, and *ph, th* are represented by *f, t*, as in *filosofia, teatro*. *H* only occurs in *ho, hai, ha, hanno* (Latin *habeo, habes, habet, habent*, which Metastasio wrote *ò, ài, à, ànno*), and combined in *ch, gh*. The *l* and *n* *mouillés* of the French are written with *gli* and *gn*. The vowels sound as in the words *father, pat; fête, pet; marine, pin; note, not; too, put*. The Italian accent is strongly marked, and affects one of the 4 last syllables of words; hence its adaptability to pentameter and hexameter verse, and its singularly musical prosody. Rhyme is only accessory. *Ridère* rhymes ill with *lèggera*, because the accent differs in position. The mark (') is only used for the sake of instruction; the sign of the grave accent is written on the finals of abbreviated words, such as *città, mercè, dî, virtù, cîd* (for *cittade, mercede, die, virtute*, Lat. *quod*), &c.—In richness of augmentatives and diminutives, both of endearment and aversion, the Spanish is equal and the Karalitic (Greenland) superior to the Italian. The definite article is more multiform than in the cognate languages. This is due to its contraction with prepositions and with *non*, thus: *del, dalla, al, nello, coi, pel, tralle, frai, sugli, nol*, &c. There are two forms of the masculine: *il, lo*, plural *i, gli*. The auxiliary verbs are due to the influence of the Teutonic tongues, though faint traces of a similar use of *esse* and *habere* may be found in ancient low Latin. Conciseness of expression is obtained by the following means: *a*, by using

the infinitive of a verb as a substantive, thus: *il parlar vezzoso*, genteel speech; *b*, by joining pronouns, when regimens, to the imperative, infinitive, or gerund, thus: *datemelo*, give it to me; *il pensarne mi consola*, the very thought of it consoles me; *raccontandoglielo*, in telling it to him, &c.; *e*, by dropping the final *e* or *o* after liquids, mostly before words commencing with consonants (see above); *d*, by dropping final vowels or syllables, before both consonants and vowels, with or without the sign of the apostrophe, even of initial vowels, as in the following from Dante:

Quando i' ndi' nomar se stesso il padre (mio)
Donne che avete intelletto d'amore,
Io vo' con voi della mia donna dire

(for *io uddi, voglio*), &c. The construction is direct, inversion frequent, and the whole phraseology freer, bolder, and more variable than in French. On the other hand, some terminations are fatiguingly long, unless the writer be master of his style; ornaments of speech often superfluous. The poetic idiom differs more from the prosaic than in any other living language in Europe, not only on account of great licenses in the alteration, addition, and omission of sounds, but also by a multitude of exclusively poetic words.—The area of the Italian language comprehends the whole peninsula and the islands of Sicily, Sardinia, Corsica, &c.; the Swiss canton of Ticino, and parts of the Grisons and Valais; S. Tyrol, some cities of Istria and of Dalmatia, and partly the Ionian islands. A rough idiom of Mediterranean navigators, and a jargon known as the *lingua franca*, are spoken in the Levant. Dante's *parlare illustre* (also *cardinale, aulico, cortigiano*) is common to all well educated Italians. Many of the dialects differ as much from it as it differs from Spanish, and some even more. This is owing to the ancient local varieties of the *Romana rustica* and of others, as well as to the tongues of foreign invaders, such as the Scirri, Heruli, Goths, Gepidae, Longobards, Suevi, Bulgarians, Pannonians, Slavi, Skipetars, Arabs, Normans, French, Spaniards, Germans, and Austrians of all sorts. While some words have many significations, as for instance *cassa*, which has 25 in Milanese, other objects have very many names devoid of analogy of any kind, as for instance turkey (*meleagris gallopardo*), which has about 20 Italian provincial names. Dante (*De Vulgari Eloquentia*) speaks of 14 dialects, one class on the west, the other on the east of the Apennines. Those on the north approach the Provençal language. C. L. Fernow (*Römische Studien*, Zürich, 1808) distinguishes in the Toscana alone, though considered as the most homogeneous, 8 sub-dialects. Dante's classification has been somewhat modified. In the "North American Review" for Oct. 1832, 17 principal dialects are noticed. All the varieties of idioms amount to nearly 1,000. There are German-speaking communities in the north of Italy (see GERMANY, LANGUAGE OF), viz., the *sette* and the *tredecì comuni*; and Al-

banian (Skipetar) settlements in both Sicilies.—The Toscana had the principal part in forming the *volgare nobile*, all great writers of the 14th century having been Tuscans. Macchiavelli's *Discorso* asserts that the idiom of Dante, Boccaccio, and Petrarch, or *la lingua Fiorentina*, is the genuine Italian. Other Italians rebel against this autocracy; and the decrees of *la crusca* have often been unrecognized. Some sounds, especially those of *e* and *ch* (like the Spanish *j* and German *ch*), are very rough; but the grammar surpasses that of all other dialects. Hence the proverb: *Lingua Toscana in bocca Romana*; for the best and most sonorous pronunciation is that of the dialect of the eternal city, which has much improved since its period of neglect during the sojourn of the popes at Avignon. In the suburbs of Rome there are at least 3 *patois*. In Tuscany the sub-dialects of Sienna, Pisa, Arezzo, Leghorn, Lunca, Fucecchio, and Volterra are worthy of mention. The Bolognese drops many medial and final vowels, as for instance: *Acqsi v'è st' nostr mond*; *o prest, o tard*; *al bsd murir* (for *Così va questo nostro mondo, al bisogno*, &c.). Those of Norcia and Spoleto, on the contrary, have lost many consonants. The Perugini, Loretano, and Camerinese are among the most noticeable in the papal legations. The Venetian softens consonants effeminately, thus: *lassate dar un baso a boccoltto* (for *lasciate dar un bacio*, &c.). The Paduan, a transition from this to the Lombard, is one of the least intelligible. The high Lombardic and the Tanzi Milanese drop final vowels, and often medials; they share with the Piedmontese and Genoese in the use of the French vowels *eu, u*, the nasals *an, in, on*, and also of French *j*. These, however, are wanting in the low Lombardic, the Mantuan, and Cremonese. The Bergamasque is the rudest of all, from contractions, thus: *Za Giove l'hica fatt el grand decret*; *Da colocat o gatt la su in di steli, inscem col cà* (for *Gir Giove aveva fatto il grande decreto*; *Di colocar il gatto fralle stelle, insieme col cane*). The Piedmontese also contracts much, and has many almost French sounds, thus: *bisogne, mangè (besoin, manger)*, &c. The Genoese approaches the Provençal, though it has some rough sounds; it often uses *r* for *l*. The Neapolitan transposes many sounds, and rejects many syllables, but is very rich in literature. There are several *patois* in the city of Naples. The dialects of the Abruzzi, Apulia, Calabria, &c., are very rude. The Sicilian is very mild and graceful, has many Arabic words (from the 9th century), and vestiges of Greek, Punic, Norman, French, and Spanish domination. In the Sardinian dialects there occur many Greek, Latin, French, and Catalan words intact, and many roots without known filiation. See *Nou dizionariu universali Sardu-Italianu, compilau de su sacerdotu benefiziau Vissentu Porru*, &c. (Casteggio, 1832). The Corsican is more akin to the Tuscan than to the idioms of the isles of the gulf of Genoa. In the Friulic there are many Slavic and old French words. This and

the Tyrolese differ most from the *favella illustre*.—**LITERATURE.** As early as the latter half of the 12th century the Italian language was moulded into a peculiar shape, different from the Latin, and free from most of the rough and uncouth words and phrases which the invading hordes of northern barbarians had introduced into it. The emperor Frederic II., who resided in Palermo till the commencement of his reign in 1212, made it the language of his court, at which he gathered, more than 100 years before Dante's poem was written, many men who delighted in composing verses. He founded the university of Naples, and schools in Palermo and other Sicilian cities. More celebrated as a poet than either himself or his two sons, Enzo and Manfred, was his secretary Pietro delle Vigne, who was wont to go about singing his songs in the newly formed language, some of which have been preserved and are deserving of praise. One of his poems is in the form of a sonnet, which indicates that that kind of poetical composition was of Sicilian origin, and was invented as early as the 13th century. He also had reputation as a statesman and orator. The 6 books of letters, still extant, which he wrote in Latin, throw much light on the history of his age, and prove how favorably Frederic and his secretary countenanced literature and men of letters. From Sicily the taste for literature seems to have spread to other parts of Italy. Foremost among the succeeding authors were the Bolognese Guido Guicciardi (died in 1762), mentioned most honorably by Dante in many of his works, Guido Ghislieri, Fabricio, and Onesto. In Tuscany also appeared Guittone d'Arezzo (died in 1294), Bonagiunta da Lucca, Gallo Pisano, Mino Macato Sanese, Brunetto Fiorentino, and others. Several sonnets and songs of Fra Guittone are preserved, and also 40 letters to a friend, the oldest specimen of the epistolary style in Italian. Dante criticizes his compositions as languid and unimpassioned. Brunetto Latini (about 1260) was the teacher of Dante and the author of *Il Tesoro*, written first in French and afterward translated into Italian, in which he aimed to give a cyclopædic view of the state of knowledge at that time. He also wrote the *Tesoretto*, consisting of moral sentences in seven-syllabled rhyming couplets. Guido Cavalcanti (died in 1300), one of the best friends of Dante, was styled by Benvenuto da Imola the second eye of Italian literature, of which Dante was the first. He was a philosophic poet, and his verses gave him a reputation for learning, and show that he had a deep knowledge of the human heart and was accustomed to moral reflections. His most celebrated canzone is on the nature of love, and is so obscure that it has often been commented on. The first book in Italian prose was the *Chronica* by Matteo Spinello, a Neapolitan, relating the history of events from 1247 to 1268. The honor of writing history in a neat style belongs also to Ricordano Malespini, a Florentine, who died about 1281. The *Agricoltura* and other scien-

tific works of Pietro Crescenzi, a Bolognese, show in several respects a thorough knowledge; but in attempting to explain vegetation and other natural phenomena after the theories of Aristotle, he fell into the errors prevalent in his age. In the 13th century began the glorious literary era of Dante, Petrarch, and Boccaccio. Dante (1265–1321) rose like a sun, and shone on Italy with an unparalleled splendor, giving to that nation almost a new life. He raised the language from comparative rudeness to the highest refinement, conceived a poem which is admitted to be one of the sublimest creations of the human mind, and charmed a people yet groping in ignorance and barbarism by the sweetness, beauty, and grandeur of his delineations, compelled them to listen to the dictates of morality and Christianity, and proclaimed the principles from which alone they could hope for rest from the desolation of civil wars. Involved in the intestine discords between the Guelphs and Ghibellines and the parties *dei bianchi* and *dei neri*, his works bear the impress not only of the ideas but of the conflicts of his time. His masterpiece is the *Divina Commedia*, incomparably the greatest of Italian epics. It was so called because he conceived that there were 3 kinds of style, the sublime, the middle or comic, and the lowest of all, which he called the elegiac, and he selected the second of these for his poem. Even in this finest product of his genius he supported the emperor and the Ghibelline party against their enemies the Guelphs. He depicted an inferno in which were placed those petty tyrants and chieftains who had filled Italy with the horrors of civil war. He described a purgatory in which those men were punished who with too little heroism and firmness had maintained the cause of justice and their country. He finally pictured a paradise in which those were rewarded who had devoted themselves only to virtue, and had labored for the commonwealth with strong hearts and magnanimous deeds. There he imagined a throne to be raised, and a crown upon it, as a reward for that Henry who, he hoped, would restore Italy to her ancient power and splendor. This political aim of the *Divina Commedia* was only incidental to its moral and religious meanings. The work displays an immense amount of theological as well as philosophical and historical knowledge, and contains some ingenious scientific views, which were fully developed and understood only after several centuries. It is for these that Redi, Magalotti, and other scientific writers quoted from him in preference to any other poet. To every succeeding age the poem has been a mine of elegant quotations, and in some of the descriptions the reader feels transported by the force and solemnity of the phrases as if it were the work of a prophet. The unfinished *Convito* of Dante is called by Monti the first sound and sober prose writing that Italian literature can boast, and the first on moral philosophy. Dante abandoned the Latin language, in which he had begun to write, for

the Italian, the perfection and embellishment of which he deemed would be of great advantage toward uniting Italy. In his Latin treatise *De Vulgari Eloquentia* he maintained that no one of the Italian dialects merited the name of the Italian language, which was rather the language spoken in all the cities, without belonging to any one in particular. Francesco Stabile, called also Cecco d'Ascoli (burned for heresy at Florence in 1327), wrote the *Acerba*, a witty poem, directed against Dante and Guido Cavalcanti, and treating of natural and philosophical subjects with little wisdom or eloquence. It is in strophes of 8 verses, the last two rhyming together, and some have therefore ascribed to him the honor of inventing the *ottava rima*. More highly esteemed was Fazio Bonifazio degli Uberti (about 1367), who wrote in *terza rima* the long allegorical poem of *Dittamondo* (*Dicta Mundi*). Cino da Pistoja (1270–1336) excelled both in jurisprudence and poetry. His songs were in praise of Selvaggia, a lady of whom he was enamored, but his legal work *Il commento* is of greater importance, and displayed an erudition which gained him invitations to lecture in many universities. Dante commended him as an improver of the language, and Petrarch lamented his death in touching verses. Petrarch (1304–74) had seen Laura de Sade at Avignon, who was the inspiration of the charming verses to which he owes his immortality, and had produced his Latin poem of *Africa*, on which by a strange misjudgment he chiefly prided himself, when in 1341 he received the laureate crown in Rome. He afterward lived in different cities, honored as a poet by various courts, till he was found dead in his library with his head resting on a book, and was said to have passed from the serenity of study to that of death. The noble delicacy and tenderness of affection which make him so distinctively the poet of love were hardly his principal merits. But philosophers, archaeologists, political orators, and all men who honor and cherish learning and patriotism, should revere his name, who left as their heritage the precept and example of seeking to end the intestine discords of his country by elevating it to a worthier life. His principal philosophical treatises are in Latin. In one of them he consoles a friend suffering under calamities; in another he defends a life of solitude for purposes of study, introducing illustrious examples from the ancients and the fathers of the church; in a dialogue on the contempt of the world he makes fine reflections on the object of life and the destiny of man; and in another he ridicules the conceit of some young men who on a visit to him had taken pains to display their skill in disputation. His various Latin treatises and poems demonstrate his erudition, justness of philosophical thought and sentiment, and exquisite skill in Latin composition. He has a greater celebrity as the father of Italian lyric poetry. In this department he surpassed all his predecessors, and has been equalled by none of his numer-

ous successors and imitators. He treated all the passions, hopes, and memories of love. With equal power and pathos he lamented the evils of his country, and preached peace and union. His various lyrical pieces, sonnets, songs, and triumphs abound in favorite quotations, and his language was so choice that every word employed by him is said to have remained in use from that time to the present. He deserves credit not only for his own writings and scholarship, but also for his services in promoting the revival of learning; and the aim of his whole life may be said to have been to seek and to accomplish the true mission of literature. A less versatile author was Giovanni Boccaccio (1313–75), who abandoned successively commerce and law for literature, studied with ardor the *Divina Commedia*, and cherished the friendship of Petrarch. His earliest compositions were a prose romance and an epic poem, written to please and indirectly to praise a lady of whom he was enamored. The poem *La Teseide* is in the *ottava rima*, of which he has therefore been called the inventor, but which was previously known in Sicily. He wrote several works in Latin, and made an expensive collection of Greek manuscripts, but is chiefly known as the author of the *Decamerone*, and thereby as the father of Italian prose. The *Decamerone* (ten days) is so called because each of the 10 persons introduced into it, 7 ladies and 3 young men, relates 10 stories per day, 100 stories being thus told in 10 days. The scene is a villa in the vicinity of Florence, whither they had fled from the plague (1348), and the description of that pestilence with which the work opens is admired as a masterpiece of eloquence. Its avowed aim was only to furnish entertaining narratives, but its real object seems to have been to present a picture of the whole human family, and to encourage virtue by commendation and to correct vice by ridicule. Touching upon whatever in human affairs may delight or instruct, its style is in turn grave and elevated, most jocose or deeply pathetic, tragic, comic, or satirical, varying with wonderful ease according to the exigencies of the story. Its beauty of composition is, however, sometimes expended on the most indelicate subjects. The *Cento novelle antiche* are for the most part written from those of Boccaccio, but some are of earlier date. They relate short adventures in a graceful and simple style, free from indelicacy. Franco Sacchetti of Florence left 300 tales, of which 258 are preserved, written carelessly but with great purity. The *Pecorone* of the Florentine Ser Giovanni, an imitation of the *Decamerone*, contains about 50 tales. This was the age of chroniclers as well as novelists. Dino Compagni chronicled the history of Florence from 1270 to 1312 with truthfulness and elegance. More celebrated is the work of Giovanni Villani, containing the history of the city from its foundation till a few years before his own death by the plague in 1348. He introduced also the affairs of other portions of Italy,

and though his narrative of remote periods is full of errors and fables, no one has left more instructive materials concerning the events which took place near his own time. His work was continued with greater prolixity by his brother Matteo to 1363, when he also fell a victim to the plague; and to 1364 by Filippo the son of the latter, who also wrote a series of biographies of illustrious Florentines. The *Specchio della vera penitenza* of Giacopo Passavanti (died in 1357) is the first example of an ascetic work in the vulgar tongue, and its style is comparable for excellence with that of Boccaccio. Various similar treatises were written by Domenico Cavalca of Pisa; the *Ammaestramenti degli antichi*, by Bartolommeo da S. Concordio, merits particular praise; and the *Trattato del governo della famiglia*, by Agnolo Pandolfini (1365-1446), is equally esteemed for its happy and useful choice of materials, and for its natural and graceful style, adorned with all the skill which the writers of his age may boast.—Most of the men who flourished in the 14th and 15th centuries were not distinguished like Dante and Petrarch for creative genius, but delighted rather in reproducing and commenting on the authors of antiquity. The printing press, invented in Germany, was most usefully employed in Venice, Bologna, and Rome, in multiplying copies of the ancient authors, corrected by learned scholars. To the passion for discovering and publishing new manuscripts was joined that of finding and interpreting ancient monuments, medals, inscriptions, and sculptures. Only the first steps toward a new civilization had been taken by Petrarch and Boccaccio. The introduction of the mariner's needle by Flavio Gioja had opened the ocean to the Europeans; the travels of Marco Polo had awakened that curiosity concerning the way to the East Indies which led Columbus to the discovery of the new world; the Arabic numerals had been substituted in Italy for the Roman; academies were established to nurture the love of letters, and courts became an asylum for the most distinguished men; and the popes in Rome, the Medici in Florence, the houses of the Visconti and the Sforzas in Milan, and of the Gonzagas and Estes in Mantua and Ferrara, became protectors of literature and the arts. Pope Nicholas V. is especially distinguished for the encouragement which he gave to every branch of learning, and for the generous sacrifices which he made in collecting books. It was under his liberal protection that Francesco Filelfo translated the Iliad and the Odyssey into Latin verse. His example was followed by numerous courts in Italy; hundreds of authors found employment and support; and the advantages of literature were, to some degree, extended among the people. Alfonso of Aragon, king of Naples, is eminent among these Mæcenas-like patrons, both for the love of letters and the sciences, and for his friendship to their cultivators, of whom he entertained a great number in his palace. Filippo Maria Visconti and Francesco Sforza vied with the Medici and

the house of Este in giving an asylum to those unhappy Greeks who wandered from their country with no patrimony but their learning. Lodovico, surnamed the Moor, invited to his court in Lombardy many learned men, painters, and architects, among whom were Leonardo da Vinci and Bramante, founded the university of Pavia, granting it many privileges, and opened schools in Milan, to which most renowned professors gave distinction. The name of the Estes should be written in letters of gold among the protectors of literature in Italy. Gian Francesco Gonzaga, marquis of Mantua, invited Vittorino da Feltre to instruct his sons, and the school which he opened was frequented by young men from Greece, Germany, and France. The example of the houses of Este and Gonzaga was imitated by the dukes of Savoy, who in the 15th century founded the university of Turin. But the most illustrious of the patrons of letters was Cosmo de' Medici, who rose to preëminence among the noble families of Europe. He founded one library in Venice and three in Florence, and established the first academy for the study and promulgation of the Platonic philosophy. Pico della Mirandola and Cristoforo Landino exercised the happiest influence in advancing and creating a popular esteem for knowledge, and especially in exciting the Florentine youth to an enthusiasm for it. The former was almost unrivalled in erudition, and seemed to possess a miraculous memory, being profoundly and prematurely versed in numerous languages, in metaphysics, and in mathematics. Lorenzo de' Medici (died in 1498) greatly and variously increased the glory which his uncle had acquired in the culture of learning. But it is lamentable, after the three great masters of the Italian tongue which the preceding age had presented, that the taste of the learned returned to the Latin language. To such a degree was Italian neglected, that it was hardly used at all in writing; it was even disdained for legal documents, and its development was arrested by a boundless reverence for antiquity. But Lorenzo the Magnificent may be considered the reviver of Italian literature, and was even called its father. Most esteemed for his virtues and manners, he enriched libraries, reopened the university of Pisa, collected numerous remains of antiquity, promoted the study of the popular poetry, and wrote himself many admired pieces for the improvement of the public taste. His *Nencia da Barberino* is the first example of Italian rustic poetry, and his *Compagnia del Mantellaccio* seems to have given the first idea of Italian satire in *terza rima*. Under him Florence became a new Athens. Angelo Poliziano (1454-1494) enjoyed the friendship of Lorenzo, attained to great erudition, and was an elegant writer both in Italian and Latin. His most celebrated works are the *Stanze*, which were imitated even by Ariosto and Tasso, and the *Orfeo*, the first regular and consistent Italian drama. Contemporary poets of less note were Burchiello, Girolamo Benivieni, and Giusto de' Conti.

To the various kinds of composition which have thus far appeared must now be added some epics. Of the brothers Bernardo, Luca, and Luigi Pulci, only the last (1431-'87) achieved lasting eminence in poetry. His *Morgante Maggiore*, burlesque and fantastic, opens the brilliant Italian series of romantic poems of chivalry. It belongs to the circle of legends concerning Charlemagne and his paladins, but degrades the primitive simple faith in them by persiflage. The *Mambriano* of Cieco da Ferrara deserves to be mentioned and compared with the *Morgante*. The best of the romantic poems of the 15th century is the *Orlando innamorato* of Boiardo, which introduced materials so beautiful and so vast as to induce Ariosto to follow in the same path. To sustain the marvels of his subject, he employed magicians and fairies in connection with the classic divinities, and beneath the veil of poetry he represented the most useful truths of philosophy. The *Orlando innamorato* was left incomplete, and the original has become rare even in Italy, on account of its rude and antique diction. Its tone is much modified in the elegant elaboration of it by Berni, which has enjoyed the most general favor. The prose literature was enriched by the writings of two artists: Leon Battista Alberti, the author of a dialogue *Della famiglia*, containing philosophical precepts for domestic life and the education of children, and of treatises on painting and architecture which gained him the name of the Italian Vitruvius; and the renowned Leonardo da Vinci (1452-1519), at once painter, sculptor, architect, mathematician, musician, the best extemporaneous poet of his time, and the author of a *Trattato della pittura*, which reveals both his scientific and artistic knowledge, and is a classical authority on the use of terms pertaining to the arts and sciences. Numerous historians, also, belong to this age. Pandolfo Collenuccio was the first to write an esteemed history of the kingdom of Naples, revived and corrected the taste for comedy, founded the first museum of natural history in Europe, and wrote dialogues after the manner of Lucian, and the solemn poem of *Inno alla morte*. Historians of travels were the Genoese Giorgio Interiano and the Venetian Cadamosto, who give the oldest narratives of the Portuguese discoveries, and the Florentine Amerigo Vespucci. Aldo Manuzio (Aldus Manutius) rendered signal services to letters and gained a European repute by the care and taste with which he published the classics.—The 16th century, in respect of Italian art and literature, is surpassed by none in modern history, and rivals the ages of Pericles and Augustus in antiquity. A family of great names occurs, each of which might form an epoch. Leo X. was the most illustrious of a series of papal patrons, bestowing liberal rewards not only on authors but on Raphael and Michel Angelo. After the extinction of Florentine liberty, literature was again protected by various reigning families. Cosimo de' Medici commanded Varchi to write his history without

any regard to persons, and we therefore owe to him a narrative of the crimes by which his own family attained the sovereignty. Under his son Francesco the learned institutions already in existence were advanced, and the academy *della Crusca* was founded. The court of the Estes in Ferrara entertained Ariosto and Tasso; most of the other courts, great and small, as those of the Gonzagas in Mantua, of the dukes of Urbino, and of Manuel Philibert of Savoy, were hospitable to scholars and poets; and numerous literary academies with capricious names, as those *dei Sonnacchiosi*, *degli Storditi*, and *dei Selvaggi*, were instituted. Preëminent among the poets of the age rose Ariosto (1474-1533), called the Ferrarese Homer, who aimed to celebrate in a great poem the origin of the house of Este. The loves and exploits of Bradamante and Ruggiero, imaginary ancestors of that house, form the basis of his romantic epic, the *Orlando furioso*, the subject of which is the war of the Saracens against Charlemagne. The courtesies and heroisms of knights, the loves of ladies, and the madness of Orlando give occasion for most various and always natural pictures, all the passions being delineated in appropriate colors, so that Tasso affirmed the excellence of Ariosto not only in versatility of invention but in propriety of treatment. Many of his similes are unsurpassed in simplicity and grace. Beside his masterpiece, he wrote satires on the politics and the rulers of his time, and his *Negromante* and *Zanotti* almost entitle him to be called the father of Italian comedy. Bernardo Tasso, the father of Torquato, was the author of the *Amadigi* and other esteemed poems. His more renowned son (1544-'95) strictly followed Virgil and Homer in the form of his *Gerusalemme liberata*, but its finest ornaments belong to the romantic spirit of his age. To the classical mythology it adds the marvels of enchantment and magic. The greater merits of the *Gerusalemme* have caused his *Rinaldo* and his pastoral drama of *Aminta* to fall into undeserved neglect. Some of his sonnets also, and other minor pieces, possess a rare beauty; and his prose letters and moral dialogues are remarkable for their eloquence and philosophical tone. Inferior to the epics of these great masters are the *Girone il cortese*, treating the legends of King Arthur, and the *Avarechide*, describing the siege of Bourges, by Alamanni, who also wrote the *Coltivazione*, a specimen of monotonous harmony. Rucellai is the author of a short and carefully finished didactic poem, entitled *Le api*. Valvagone wrote in the *Angeleide* a description of the battle between the good and rebel angels, from which Milton is supposed to have derived materials. The *Italia liberata dai Goti*, by Trissino, is in every respect a wretched imitation of Homer; but his *Sofonisba* is the first Italian tragedy of high merit. Leo X. himself witnessed the production of the *Rosmunda* and the *Oreste* of Rucellai. Better tragedies are the *Tullia* of Martelli, the *Canace* of Sperone Speroni, the *Torrismondo* of Torquato Tasso, and

the *Edipo* of Andrea dell' Anguillara, all of which display a too servile imitation of the Greek authors. The Latin comedy, meantime, was made too strictly the model of the Italian. The learned comedy (*commedia erudita*) was cultivated at almost the same time by Cardinal Bibbiena, Ariosto, and Macchiavelli. The best examples are the *Cassaria* and *Suppositi* of Ariosto, the *Calandra* of Bibbiena, and the *Madragola* and *Clizia* of Macchiavelli, the last especially remarkable for their knowledge of men. The *Pastor fido* of Guarini deserves especial mention as one of the pastoral poems with which Italy abounded, inferior at furthest only to the *Aminta* of Tasso. At this period a new and brilliant step was taken by the Italians in the dramatic art, by the union of music with poetry. The invention of the opera belongs to the Florentines, the first having been the *Daphne*, the words of which were by Rinuccini and the music by Peri, and which was represented in 1597. Orazio Vecchio of Modena produced melodramas, which Muratori regards as the beginning of the modern opera. The attraction of this new style was so great that authors and musicians immediately devoted themselves to it in Italy, and it was soon introduced into Germany and France. Every variety of poetry seems to have been tried in this age with success. Berni was the head of a school of burlesque poetry, called from him the Bernesca rhyme. The best of his pieces, the *Orlando innamorato*, possesses grace, elegance, and originality. One of his imitators was Agnolo Firenzuola, who is more esteemed for the amenity of his prose writings. To Ariosto belongs the first place among the satirical as well as romantic poets of his age. Scarcely comparable with him are the satirists Ercole Bentivoglio, Nelli, and Luigi Alamanni. Pietro Aretino (1492-1557), the most indelicate of Italian writers, evinced a versatile and brilliant genius in almost every style of composition. The monk Folengo (died in 1544), better known under the name of Merlino Coccajo, was either the inventor or one of the first and happiest improvers of macaronic poetry. Superior to a crowd of rhymers, imitators of the ancients or of Petrarch, was the sculptor Michel Angelo, whose style was influenced by the study of Dante. Pietro Bembo (died in 1547) was the restorer of elegance and correctness to the native language, and revived its popularity among the learned. Francesco Maria Molza excelled in thoughtful and humorous poetry. The *Galateo* and other writings in prose and verse of Giovanni dalla Casa are still esteemed for vigor of thought and beauty of expression. The translations of many of the classics into Italian by Annibale Caro (1507-'66) are accounted by some critics superior in style even to the compositions of Petrarch. His versions have an air of originality, and it was said that Virgil would hesitate whether to give the palm to his own work or to that of his translator. His original writings obtained the highest praise for elegance.

The sonnets of Angelo di Costanzo have been said to combine every merit of which the sonnet is capable. He wrote also a history of Naples. The most eminent poetess of this age was Vittoria Colonna, highly applauded by Ariosto. The *Arcadia* of Sannazzaro holds the first rank among the bucolics, written in alternate prose and verse in a vigorous, correct, but constrained style. The eclogues of Baldi are philosophical maxims versified. An important place in the literature is held by political writers, foremost among whom was Macchiavelli (1469-1527). A dramatist and historian of Florence, he is chiefly known as a profound and philosophical statesman by his discourses on Livy, his dialogues on the art of war, and especially by his *Principe*, a manual of government, which was constantly in the hands of such sovereigns as Charles V. and Sixtus V., and the real intent and character of which has been long in dispute. His style is marked by simplicity, strength, thought, and a rare but felicitous use of ornament. Other political writings were the *Ragione di stato* of Botero, and the *Repubblica Fiorentina* of Giannotti. Nearer to Macchiavelli in merit was Paruta (1540-'98), the author of *Discorsi politici*, and of a treatise *Della perfezione della vita civile*. The most renowned of Italian historians is Guicciardini (1482-1540), whose work embraces the period from 1494 to 1534. It is esteemed for impartiality and for its moral and political reflections, but is so diffuse and tedious that it is hard to read. Paolo Giovio wrote in Latin a partisan history of his own time. Historians of Florence were Nardi, Varchi, Nerli, Segni, Capponi, and Scipione Ammirato; the *Storie Fiorentine* of the last includes the events from the foundation of the city to 1574. Historians of Venice were Bembo, Paruta, and Contarini; of Genoa, Giustiniani, Bonfadio, and Foglietta; of Ferrara, Cinzio and Falletti; and of Naples, Costanzo, Porzio (*La congiuro dei baroni*, &c.), and Summonte. General histories were written by Giambullari and Adriani. Davanzati translated Tacitus to prove the conciseness and energy of the Italian language, and made his version shorter than the original. He also wrote a history of the reformation in England. The splendor of the fine arts in this century gave occasion for historians of art, the principal of whom was Vasari (1512-'74), whose lives of the most excellent painters, sculptors, and architects of Italy are written with naturalness and grace, and contain interesting notices of prominent Italian works of art. The autobiography of the Florentine goldsmith Benvenuto Cellini, one of the liveliest books in the literature, not only recounts his own fortunes, but gives curious notices of the courts of Rome, Florence, and France. He wrote also valuable treatises on jewelry and sculpture. Works on painting were written by Bernardino Campi of Cremona, Lomazzi of Milan, and Armenino of Faenza. Vignola and Palladio gained distinction as writers on architecture, and Marchi by a treatise on military

architecture. Philosophy now began to assume an independence of the scholastic and ecclesiastical systems, and Girolamo Cardan and Giordano Bruno ventured upon the boldest speculations. The mathematics were cultivated by Tartaglia, Cardan, and others. The *Istituzione di tutta la vita dell'uomo* of Alessandro Piccolomini treats of education, marriage, the government of a family, and the chief end of man. The *Cortigiano* of Castiglione has rare literary merits, making courtesy the theme of many learned and weighty reflections. Numerous novelists now flourished, among whom Bandello holds the first rank, his *novelle* being chiefly founded on real and common events. The novels of the monk Firenzuola and the *Cene* of Lasca are both elegant and indelicate. Vettori and Salviati commented on the older poets, and the latter was engaged in compiling the *Vocabolario della Crusca*, then the most important philological work in the language. All words not used by the great Florentine authors were excluded from it; even Tasso was not admitted as an authority.—In the 17th century the natural sciences especially flourished. Under able patrons, the principal of whom was Duke Ferdinand of Tuscany, the Italian universities attained unprecedented celebrity. Scientific academies were founded in Rome, Florence, Bologna, and Naples; the Florentine *Accademia del Cimento* embraced the most illustrious savants of the time, and published important accounts of its researches. Preëminent among philosophers was Galileo (1564–1642), who was denounced as an innovator, and maintained the Copernican system only at his peril. His *Dialoghi* and other works are written with elegance, his style and taste having been formed by reading Ariosto. His most noted pupils were Viviani, Torricelli, and Castelli, and contemporary physicists were Borrelli, Malpighi, Bellini, and Francesco Redi. The learned and philosophical juriconsult Vincenzo Gravina attracted scholars from all parts of Europe to his lectures in Rome on public law, contained in his *L'origine del diritto civile*, and other publications. The greatest historians were Sarpi, Davila, Bentivoglio, and Pallavicini. Sarpi (died in 1623), the defender of the republic of Venice in its contest with the holy see, wrote an anti-papal and spirited history of the council of Trent, which was replied to by Pallavicini in a work on the same subject. Davila, after 16 years' residence in France, narrated the civil wars of that country in a work esteemed for its truthfulness, and in respect of style one of the best Italian histories. Bentivoglio, the papal nuncio in Flanders, wrote of the Flemish wars of his time, many of the heroes of which he knew personally. Baldinucci, Dati, and Scamozzi were historians of the fine arts, and Cinelli and Boccacini of literature, while Bianchi treated important historical problems as to migrations, colonies, voyages, and the origin of monarchies and republics. Montecucculi, the military antagonist of Turenne, acquired distinction

as an author by his aphorisms on the art of war. The Jesuit Bartoli wrote the history of his society, and the sermons of the Jesuit Sgeneri were unrivalled in eloquence. The first Italian literary journal, the *Giornale de' letterati*, was established in Rome in 1668. A want of naturalness and truthfulness marked the poetry of the age. External delineations, trifling details, conceits, and plays upon words were the leading objects of the poets. At their head was Marini of Naples (died in 1625), who was admired not only in Italy but in France and Spain, and originated the poetical school of the Marinists, by which only his faults were imitated. Among his contemporaries and successors were Chiabrera, Guidi, Tassoni, and Marchetti. The foundation of the academy of Arcadians in Rome in 1690 by Crescimbeni and Gravina introduced an affectation of pastoral sentiments and habits in place of Marinism. Menzini, Zappi, Maggi, De Lemene, Salvator Rosa, and Bracciolini wrote satirical, erotic, and facetious verses. Throughout the 17th and 18th centuries the opera was the favorite Italian exhibition. It had long been produced with theatrical and musical splendor, when Zeni of Venice (died in 1750), and especially Metastasio (died in 1782), wrote operatic plays having remarkable poetical merits.—When near the beginning of the 18th century the war of the Spanish succession raged in Italy, and the kingdom of Naples fell beneath the sceptre of the infante Don Carlos, and afterward of Ferdinand III., literature and the sciences were cultivated with renewed vigor. Naples produced Giannone, distinguished in the department of history. Capasso in literature, Cirillo in medicine, Mazocchi in archæology, Genovesi in political economy, one Gagliani in architecture, and another in domestic economy and philology. Filangieri rivalled Montesquieu in the philosophy of legislation; Pagano wrote on the criminal law; Poli distinguished himself in the positive sciences; Maffei and Calzabigi devoted themselves to poetry. The university of Bologna was now in its splendor, its academy of sciences taking the name of "The Institute." Marsigli, Stratico, Cesarotti, Foscarini, the brothers Gozzi, Morelli, Maffei, Pompei, Lorenzi, Mazzuchelli, and Serassi made the city of Venice illustrious; but political jealousy prevented the culture of the economical and legislative sciences there, which under Beccaria and others were making great progress in other parts of Italy. In Tuscany, the famous French encyclopædia was republished. In the cities of Lombardy flourished Scopoli, Fontana, Frank, Tissot, Spallanzani, Bertola, Villa, Natali, Volta, Scarpa, Tamburini, Parini, Beccaria, Verri, Landriani, Agnesi, Carli, and others, devoted to literature, art, science, and the development of political and ethical principles. Bodoni raised the art of typography to an admirable elegance. Prominent among the patrons of literature was Victor Amadeus II. of Savoy. The Italian drama had as yet attained to excellence only in the opera, and lacked superior

tragedies and comedies. It received an impulse in the 17th century from the French theatre, Martelli of Bologna (died in 1727) being the first who attempted to naturalize not only the French tragedy but the Alexandrine verse. The *Merope* of Maffei was the best tragedy produced in the early part of the century. A greater influence was exerted upon his age and upon literature by Alfieri (1749-1803), the head of an important school of tragedy. Hostile alike to the operatic lightness of the Italian drama and to the formal and complicated intrigues of the French, he went to an opposite extreme, demanding in tragedy both the utmost intensity of passion and the utmost simplicity of treatment. He was the poet of energetic action and profound thought and feeling, as Metastasio was of love. Abandoning the customs of the court of Louis XIV., he revived the simple sublimity of the Greek stage, which had been the object of his favorite studies, and which was removed alike from French effeminacy and Spanish extravagance. A reformation in the Italian comedy was meantime effected by Goldoni (1707-'93), the only genuine comic poet that Italy can boast, who sought in imitation of Molière to substitute for the *commediu dell' arte* a natural comedy of manners. In his efforts to give to the stage a more human and real character by ridding it of the traditional masks of the Harlequin, Pantaloon, and other stock characters, he had to contend especially against Chiari and Carlo Gozzi. The example of Kotzebue and Iffland gave rise to a lachrymose school of dramatic composition, maintained by Avelloni, Gualzetti, Greppi, and especially by Federici. The most illustrious historians were Muratori (died in 1750), Maffei, Denina, Mazzucchelli, Tiraboschi, and Lanzi (died in 1810). The *Annali d'Italia*, *Verona illustrata*, *Rivoluzioni d'Italia*, *Scrittori d'Italia*, *Storia della letteratura d'Italia*, and the *Storia pittorica d'Italia* were respectively their best works. The writings of Muratori and Tiraboschi still maintain their reputation both for erudition and criticism. In archæology, the names of Fabretti, Gori, Mazzocchi, Martorelli, Passeri, and Carli were distinguished. Campanella continued the philosophical movement of Bruno in opposition to scholasticism, and Vico (1670-1744) founded the new science of the philosophy of history. His *Scienza nuova* is a view of general history, founded on the idea of Divine Providence and the essential elements of the common nature of man. Algarotti, Bettinelli, Buonafede, Vanetti, Tartarotti, and Alessandro Verri also added to the glory of the literature by abandoning the pedantic style that had been in vogue and introducing an acquaintance with foreign ideas and productions. Baretti contributed to the revival of good taste by ridiculing the Arcadians. Parini (1729-'99) excelled in satirical poetry, his *Giorno* being as remarkable for elegance as for severity upon the effeminate life of the wealthy Milanese nobles. Among the works of Cesarotti was a

translation of Ossian, esteemed in many respects among the happiest productions in the language, and which Alfieri confessed to have been of service to him in the composition of his tragedies. — The political and military movements in Europe of the last decade of the 18th century occasioned a regeneration not only of the literature but of the national spirit of the Italians. The early part of the 19th century rivals the age of Leo X., presenting Canova, Longhi, Cicognara, Appiani, and Beltrami in the fine arts; Monti, Foscolo, Pindemonte (partially contemporary with whom was Alfieri) in literature; and Volta, Melchiorre Gioja, Romagnosi, Scarpa, Spallanzani, and Oriani in the sciences. The author who doubtless exerted the greatest influence on the regeneration of poetry was Vincenzo Monti (1754-1828), who in the contest between the classic and the romantic tendencies favored the former, and in the contest between the Gallicists, or imitators of the French literature and idioms, and the purists, who made Petrarch, Dante, and the other old Italian masters their models, sided with the latter. His poems, as *Basvilliana* and *Feroniade*, his tragedies, as *Galeotto Manfredi*, his elegy *Mascheroniana*, the *Proposta*, in which he disputed the restrictions which the Della Crusceans had fastened upon the language, and his translation of the *Iliad*, alike display an admirable and nervous style. Pindemonte also made a light and graceful version of the *Odyssey*, and in his original poems especially lamented the desolation of his country. Ugo Foscolo (1777-1827) belongs to the school of Alfieri. His *Ultime lettere di Jacopo Ortis*, a political and passionate romance in imitation of Goethe's *Werther*, is supposed to describe his own troubled life. He wrote the lyric *I sepolcri*, and other works in prose and verse, remarkable both for power and beauty. Mezzanotte celebrated in verse the struggle of the modern Greeks for liberty, regarding it not only as a political but as a religious conflict between Christianity and Islamism. The lyrical poems of Leopardi are highly esteemed. Among the epic and didactic poets were Botta, Ricci, Bagnoli, Arici, Grossi, Sestini, Pananti, and Lorenzi. Antonio Cesari (died in 1828) was the chief of the Trecentists, a school which carried its love of the Italian authors of the 14th century to affectation. Stratico published a dictionary containing only the words used by the Marinist authors. Mameli had exhibited the greatest promise in his ode to Venice, before he fell in the conflict at Rome in 1848 '9. Prati, Aleardi, and the versatile priest, dramatist, and journalist Dall' Ongaro, are among the best contemporary lyric poets of Italy. The most successful recent dramatic productions are the comedies *Goldoni e le sue sedici commedie* and *La satira e Parini*, by Ferrari; *Le scimmie* and *Le due sorelle*, by Gherardo del Testò; *Torquato Tasso*, by Giacometti; *Cromwell*, *La notte di St. Bartolommeo*, and *Luigia della Valliera*, by Pietro Corelli; *Cuore ed arte*, by Caterino de' Medici Fortis; and the tragedies *Gasparsa Stampa*, by Ca-

bianca; *Piccarda Donati*, by Marenco; *Camma* (represented by Ristori in Paris) and *Tentazione* (1856), by Montanelli, the last having great merit not only as a play but as a poem. For the revival of pure and unaffected writing Italy was much indebted to the example of Carlo Botta, called by his countrymen the modern Thucydides. He wrote histories of the war of American independence and of Italy during the last three centuries. Vacani was a historian of the Peninsular war. Pietro Colletta wrote the history of Naples from its conquest by Charles III. of Spain in 1734. Amari wrote the history of the Arabs in Sicily and of the Sicilian vespers, illustrating obscure periods in an age of national glory. Both were reflective or philosophical historians. Cesare Cantu wrote an immense universal history, a work of critical and artistic merit, which has been translated into several languages. He has also written novels, poems, critical essays, and other histories, one of the most important of which is *La storia di cento anni* (1851). Bianchi Giovini, a prominent and anti-Catholic journalist, wrote a history of the popes, a biography of Fra Paolo Sarpi, a history of the Hebrews, and a work on the supposititious Pope Joan. The political writings of Mazzini consist chiefly of articles in journals. Cesare Balbo wrote historical meditations, a life of Dante, and a summary of the history of Italy. Frascini wrote an accurate and authoritative statistical work on Switzerland (1847-'51). La Farina is the author of a history of Italy from the most ancient to recent times; Federico Sclopis, of a history of Italian legislation (completed in 1857); Luigi Zeni, of an excellent compendium of Italian history; Romanin, of a learned history of Venice, written in opposition to that of Daru, and of a work on the Venetian inquisitors; Carlo Gemelli, of a history of the Belgian revolution of 1830; Giuseppe Rubini, of a history of Russia from 862 to 1725; Canette, of a history of Amadeus II. of Savoy; Canale, of a history of the Crimean war of 1854-'55; Gallenga, of a history of Piedmont; Angelo Brofferio, of a history of Piedmont from 1814 to 1849, and of other works interesting from their patriotic spirit as well as literary merit; Anelli, of a history of Italy from 1814 to 1850; Carlo Cattaneo, of a history of the insurrection at Milan in 1848 (he was a member of the committee that directed the operations against the Austrian militia, and a participant in the struggle); he also compiled the *Archivio triennale*, an elaborate and most careful and valuable collection of authentic documents relative to the events that occurred in Italy from 1848 to 1850; Federico Torre, of a history of the French expedition to Rome in 1849; Ferrari, in a work on republican federation, treated the question under what form of government Italy ought to be reorganized; L. C. Farini wrote a history of the Papal States from 1814 to 1850; Gualterio, of the last Italian revolutions (1852); and Vecchio, of the events in Italy in 1848-'9. Meantime a taste

for illustrating the national antiquities prevailed, and Inghirami published his *Monumenti Etruschi*, Delfico his *Origini Italiane*, Fanucci his *Storia dei Veneziani, Genovesi e Pisani*, Manno his *Storia di Sardegna*, Bres his *Malta illustrata*, and Pompeo Litta his learned *Famiglie celebri d'Italia*, containing interesting studies on every period of the national history. Visconti (1751-1818) was distinguished in classical archaeology, and Sestini was unrivalled in numismatics, making medals illustrate geographical questions. The natural sciences were advanced by five illustrious savants, who were nearly contemporary, Volta, Galvani, Scarpa, and Spallanzani. The discussions of Galvani and Volta concerning their new discoveries in electricity divided the scientific men of Europe into two factions; and the poets followed their example. Scarpa, a learned disciple of Morgagni, reduced anatomy to a positive science. Spallanzani wrote on physics and physiology in a style worthy of one who declared philosophy itself imperfect unless its principles were elegantly expressed. Gioja and Romagnosi treated philosophical questions and the economical and political sciences, the *Filosofia della statistica* being the principal work of the former, and the *Genesi del diritto penale* of the latter. Manzoni produced new models of lyric verse, and examples of historical dramas and novels in his *Adelchi*, *Il conte di Carmagnola*, and *I promessi sposi*. To the modified classical school of Monti belong the dramas of Silvio Pellico, chiefly known by his *Francesco da Rimini* and *Le mie prigioni*, and those of Nicolini, often founded on the history of his country, and strongly marked by patriotic feeling. The example of Sir Walter Scott in the production of historical romances had many followers in Italy. *I promessi sposi* of Manzoni (1825) was succeeded by the *Monaca di Monza*, *Luisa Strozzi*, and *Il conte Ugolino della Gerardesca* of Rosini; the *Margherita Pusterla* of Cesare Cantu; the *Marco Visconti* of Grossi; the *Ettore Fieramosca* of Azeglio; and the *Battaglia di Benevento*, *Assedio di Firenze*, *Isabella Orsini*, and *Beatrice Cenci* of Guerrazzi. Italy received with enthusiasm these romantic delineations from her ancient history. The romance entitled *Famiglia* (1850), by Bersezio, is one of the best late Italian novels. The *Dr. Antonio* of Ruffini is esteemed for its pictures of Italian scenery. Accomplished women have taken a considerable part in recent Italian literature. The *Morte di Adone* of Teresa Bandellini was followed by the learned philosophical and religious poems of Diodata Saluzzo, with which she intermingled slight lyrical pieces. Cecilia de Luna Folliero wrote on the education of girls and the moral influence of music. Giustina Rinier Michiel celebrated in song the festive days and commemorated events of Venice. Isabella Teotochi Albrizzi wrote a graceful and truthful biography of Canova. The work of the Signora Ferucci on the education of girls received the encomiums of Gioberti and other distinguished thinkers.

Other female authors are Lucrezia Marinella, Sabina Rasori, Silvia Curtoni Verza, Costanza Moscheni, and Leonora Fonseca Pimentel. In philosophy, the names of Gioja and Romagnosi were succeeded by that of Pasquale Borelli (Lallebasche), the author of an introduction to philosophy, and of works on the nature and genesis of thought, in which he opposed the empiricism of Romagnosi. Pasquale Galuppi (1770-1846), in elaborate works, combated the philosophical tendencies of the 18th century by doctrines founded on the philosophy of the fathers of the church. He was a student of the German philosophers, and one of his most interesting works was on the changes of modern philosophy from Descartes to Kant. Mamiani (born in 1802) published his *Rinnovamento dell' antica filosofia Italiana* with the design of restoring the philosophical method of the church fathers, which he regarded as the national philosophy of the Italians, and of reconciling the extreme conclusions of speculative philosophy with the dictates of common sense. Rosmini (1787-1855) and Gioberti (1801-'52) developed ideal Catholic theories, and founded a school of which Tommaseo is now a leading representative. According to Rosmini, the only necessary and innate idea is that of the possibility of being. This combines with our perceptions to form all our knowledge and all our ideas, mingling the ideal world with the real, and speculative with practical life. In the application of this theory he inculcates the political as well as spiritual supremacy of the Catholic church. Gioberti, a more brilliant and learned author, denounced psychology, and made the formula *L'ente crea le esistenze* the ontological basis of philosophy. His system is at once philosophical and ecclesiastical, and no other writer has more eloquently eulogized the method of the church fathers or combated the principal modern philosophical systems. His theory of ecclesiastical supremacy is akin to that of Mamiani and Rosmini. Other philosophers of less ecclesiastical tendencies are Alfonso Testa, Ausonio Franchi (Bonavino), and Carlo Cattaneo. The *Calcolo di probabilità dei sentimenti umani* (1855) of Mastriani is an attempt to give a physiological basis to philosophy.—The principal historians of Italian literature are Tiraboschi (1772-'82), Maffei (2d ed. 1834), Cimorelli (1845), Emiliano Giudici (1851), Malpaga (1855), Lombardi (of the 18th century, 1827-'30), Ugoni (of the second half of the 18th century, 1856-'9), and Levati (of the first quarter of the 19th century, 1881).—For Italian art, see MUSIC, PAINTING, and SCULPTURE.

ITARD, JEAN MARIE GASPARD, a French surgeon and philosopher, born in Oraison in 1775, died in Paris, July 5, 1838. He was educated at the college of Riez, and at that of the Oratorians at Marseilles. He was in a banking house at Marseilles, but at the age of 18 was appointed by the revolutionary committee surgeon of the military hospital of Toulon, although he had never read a medical book or seen a sur-

gical operation. He devoted himself to study with ardor, and two years later was made a surgeon of the 2d class at the hospital of Val de Grâce. He was soon ordered to a distant port; but appreciating the advantages of a residence in the capital, he resigned and remained in Paris. In 1799 he was appointed physician of the institution for deaf mutes, where he became known by his efforts to instruct a young man found wild in the forests of Aveyron. (See IMBIOC.) In 1801 Itard published a memoir giving the results of a year's effort in instructing him, and in 1807 another giving the final results. He next gave his attention to the training of deaf mutes in articulation, in which he succeeded almost as well as Pereira. In 1821 he published an elaborate work, in 2 vols. 8vo., on the diseases of the ear and of the sense of hearing. He also wrote a treatise on pneumothorax and several papers in the "Dictionary of Medical Sciences."

ITASCA, LAKE OF, a small body of water in Minnesota, on the N. W. border of Cass co., being one of the uppermost of the multitude of lakes which form the sources of the Mississippi river. It lies in lat. 47° 10' N., long. 95° 54' W., near the summit of the Hauteurs de Terre, the watershed between the Red river of the North and the streams flowing to the gulf of Mexico, 1,575 feet above the level of the sea. It is a beautiful sheet of water, surrounded by hills, and its shores are clad with pines. It was discovered by Schoolcraft, July 13, 1832. The remotest source of the Mississippi is a small rivulet rising among the hills a few miles S. of this lake, and falling into it after forming a number of little basins. The stream issues from the N. end of the lake 10 or 12 feet wide, and 12 or 18 inches deep.

ITASCA, a N. co. of Minnesota, bounded N. by Rainy lake and Rainy Lake river, separating it from British America, and drained by several tributaries of that stream, and by the Mississippi, which crosses it twice, first in a S. E. and then in a S. W. direction; area, about 7,500 sq. m.; pop. in 1850, 97. It is not included in the territorial census of 1857. Its surface is uneven and diversified by many small lakes. The productions in 1850 were 90 bushels of Indian corn, 1,050 of potatoes, and 43 tons of hay.

ITAWAMBA, a N. E. co. of Miss., bordering on Alabama, and drained by Tombigbee river; area, 900 sq. m.; pop. in 1850, 13,528, of whom 2,127 were slaves. It has a level or undulating surface, almost without timber. The soil is a dark, rich loam, containing much lime. The productions in 1850 were 533,507 bushels of Indian corn, 105,692 of sweet potatoes, 473 lbs. of rice, and 5,519 bales of cotton. There were 9 grist mills, 6 saw mills, 46 churches, and 661 pupils attending public schools. The Mobile and Ohio railroad passes through the county. Capital, Fulton.

ITCH, or SCABIES, a parasitic disease of the skin. There is no doubt that the true character of scabies was known among the ancient

Greeks and Romans, but the animal was supposed to be a louse. Avenzoar in the 12th century alluded to its parasitic nature; and Aldrovandus in the 17th gives a good description of the animal, but says it has no legs. Moutet at the same time says it is identical with the mite inhabiting cheese. Occasionally after this we find mention of this parasite in the writings of the great medical fathers, but it was generally forgotten when the grand scientific hoax was played in 1812 by the medical student Gales in Paris, who was cunning enough to substitute a cheese acarus concealed beneath his nail, and thus deceived the judges on the prize offered to the discoverer of the cause of this disease. The Corsican Renucci finally established its reality, taught by the old women of his birthplace, and Raspail gave the first scientific description of the animal in 1839. Since then the best observers of its habits have been Bourguignon, Eichstedt, Schinzinger, and Hebra.—The *sarcoptes hominis*, or *acarus scabiei*, presents 3 forms. The mature female is discernible by the unaided eye, as a white speck $\frac{1}{4}$ of a line long. It is of a white color, and resembles in shape a tortoise shell, with an arched back and flat belly. On the back are seen bristles or hairs, and little spines. The skin is tough, and shows irregular transverse parallel rings. There are 4 pairs of legs, two of which are situated in front, and project beyond the anterior, the others beyond the posterior end of the body. The anterior feet are provided with sucking disks, and with hairs or bristles armed at their extremities with minute claws. The head is bluntly conical, somewhat retractile, and situated between the anterior feet. The mouth consists of a double upper and under lip, between which play the jaws armed with teeth, moving in a horizontal direction up and down, like the blades of scissors over each other, and resembling the claws of a lobster. Eyes are wanting. The male is only half the size of the female, and only recently has been known and figured. In structure it differs but slightly from the female; it is not white and shining like the latter, but black and compressed. The young, when first hatched, have but 3 pairs of legs, and in them no distinction of sex is noticeable. In order to become mature they undergo 3 separate stages of torpidity, before each of which the body is fat and large in comparison with the extremities. During these they burrow into the skin. By the first process they acquire the wanting pair of legs. When mature the female digs a shallow burrow, and after impregnation ceases to creep over the outer skin, but penetrates deeper and deeper, forming the long holes so well known. The male never enters these true burrows where the eggs are found, but digs himself a shallow cell, or seeks new fields for his rambles. The female as she goes on her oblique and downward course leaves behind her each day a new-laid egg and fecal matter. After 14 eggs are thus deposited, the larva of the first becomes mature, and emerges from its birthplace to go through the process above

described, leaving behind it its broken shell. All stages of development may be seen in these burrows, from the amorphous form in which the eggs are deposited to the perfect young, before they break their prison walls. The mother never leaves her hole, and sometimes wanders along for 4 inches beneath the surface; 50 eggs and broken shells are sometimes counted in such burrows. The whole time required for the young to reach maturity after impregnation is estimated at 6 weeks.—Infection is produced by the transfer of males and young from one host to another. The *sarcoptes* loves warmth, and on this account has been called a nocturnal animal, though improperly, for its wanderings are caused by the warmth imparted to the body of its host by lying in a warm bed, by sleeping with another, or by dancing in the evening; and thus it is that they are conveyed from one person to another. It may happen that the female may be scratched out of her burrow, and thus be transplanted to another part of the same, or to the body of another host. Scabies is seldom if ever caught by handling patients, however freely this may be done, from the fact that such examinations take place in cool rooms, when the parasites are quiet. Their favorite lurking places are the tender skin between the fingers, and folds of the axillæ; and on infants we find them distributed over the whole surface of the body. They have been cultivated also on the face and scalp, and may inhabit any part of the body. In persons who suffer from cold hands and feet we often find these parts entirely free from them, while the rest of the body may be covered with the eruption; and the same love of heat is exemplified by the immediate relief which a patient, wrought up to frenzy by the itching of a general scabies at night, finds by jumping out of bed into the cold atmosphere of winter. In order to bore through the epidermis, beneath which it seldom penetrates, the acarus supports itself on its anterior end by means of its hinder legs, and works away with its lobster-like claws. It takes generally 20 or 30 minutes to penetrate the outer layer, but when this has been pierced the progress is more rapid. The poorer in nutriment they find the epidermis the deeper they penetrate, and the greater is the exudation, which lifts up the animal, and causes the white color of the burrow. The young brood seems to require the tender and last formed epidermal layers for its food, and therefore bores further and causes more itching. The long burrows of the females, which cause the real disease, run an irregular course, and become smaller by age as the exudation is absorbed. The entrances generally remain open for the exit of the young, and admission of air. The 3d or 4th week after inoculation a papular eruption appears; subsequently excoriations, vesicles, pustules, and deposition of pigment show themselves, which are merely the results of scratching, and have no other connection with the parasite than that they are caused by the itching which the animal excites. The same

results precisely would follow the same amount of scratching from any other cause.—A peculiar form, known as the Norway itch, consists of huge conical crusts raised on the surface of the skin. This variety affects even the face and nails. Its common occurrence in Norway and rarity elsewhere, only half a dozen cases having been observed in other countries, has led to the supposition that the disease is owing to some other acarus; but Hebra has shown that the crusts consist of dried epithelium and dead acari, and in the few cases in which they have been found present the live animals were identical with the ordinary *sarcoptes*. This variety leads often to serious complications, as immobility and great swelling of the limbs. Sometimes a circumscribed part of the body is thus affected, while elsewhere it presents the usual appearances of itch. No satisfactory explanation has yet been offered of its cause, but it yields to treatment as well as the simple sort.—Scabies is found all over the world. In Germany, where the old system of apprenticeship and its attendant wanderings through the land is kept up, and where barracks are filled with dirty soldiery, the disease is borne from one part of the land to another, and thus never dies out. With us it is now comparatively rare, though it occasionally runs through asylums and schools, and thus finds its way into good society. As to treatment, the chief indication is of course to destroy the parasite and its eggs. Little can be said here about the many plans of the present dermatologists; and it is almost unnecessary to say that the use of internal remedies is absurd. Several methods have been advised, called "quick cures," which require but a few hours for their application; but in many cases they fail, and produce an artificial inflammation of the skin. Of course, if any animal or a single egg remain, the disease is not cured. Hundreds of remedies are advised, but the essential agent in its treatment is sulphur. This, in the form of lotions or ointment, and combined with the proper use of baths and potash soaps to soften the skin, will almost always cure in 2 or 3 days. But after the death of the animals and their embryos, much may still remain to be done to remove the eczema, papules, and pustules they have indirectly caused, and which are to be treated as simple cases of the same diseases.

ITHACA, a village and the capital of Tompkins co., N. Y., situated on both sides of Cayuga inlet, $1\frac{1}{2}$ m. from the head or S. end of Cayuga lake, and 162 m. W. by S. from Albany; pop. in 1855, 4,908; pop. of the township, which bears the same name, 7,153. The village is built partly on a fine plain, partly on the slope of a range of hills which bound it on all sides except the N. It is a place of commercial activity and an entrepot for the transshipment of Scranton and Lackawanna coal brought by the Cayuga and Susquehanna railroad, which connects it with the New York and Erie railroad, while by means of a daily line of steamboats on the lake between Ithaca and Cayuga bridge, it

is connected with the New York central railroad. It is also largely interested in the trade by canal. The quantity of coal shipped here is about 90,000 tons a year. The township contains 6 flour mills, 2 paper mills, 2 breweries, 1 oil mill, 4 plaster mills, 2 tanneries, 1 manufactory of lead pipe, 1 of rakes, 1 of oil cloth, 2 of sewing silk, 1 of collars, neck ties, &c., and 4 of carriages, 8 boat yards, 7 saw mills, and 4 furnaces and machine shops. It has 9 churches (1 Baptist, 1 Congregational, 1 Episcopal, 3 Methodist, 1 Presbyterian, 1 Reformed Dutch, and 1 Roman Catholic), an academy, excellent public schools, 4 printing offices, and 2 banks. The court house, gaol, and clerk's office are fine brick or stone buildings. There are 10 or 12 beautiful cascades in or near the village.

ITHACA (mod. Gr. *Theaki*), the 6th in size of the Ionian islands in the Mediterranean, 2 m. E. from Cephalonia and 17 m. W. from the mainland of Greece; length 15 m., greatest breadth, 4 m.; area, 44 sq. m.; pop. in 1858, 11,848. It is nearly divided in two by the deep harbor of Porto Molo on the E. coast. There is another bay of lesser dimensions on the N. The surface is mountainous, a limestone range, with many craggy peaks, running the whole length of the island. The soil is light and shallow, but nearly $\frac{1}{4}$ of the surface is cultivated, and yields grain, currants, and olives, which with good wine and honey are the principal agricultural products. The people however are mainly engaged in maritime trade. The climate is noted for its salubrity. The capital and chief port is Vathi, built on a harbor of the Porto Molo. Ithaca is commonly believed to be the island of that name celebrated in the Homeric poems as the kingdom of Ulysses. On the sides and summit of Mount *Æto*, at the foot of Porto Molo, are some Cyclopean ruins which the islanders call the Castle of Ulysses. At the foot of a white cliff, on the S. E. coast of the island, there is a beautiful perennial spring, traditionally identified with the famous fountain of Arethusa, and it is currently believed that the precipice is the one to which the poet refers when he represents Ulysses as challenging Eumæus "to throw him over the great rock" if he does not speak truth. A collection of ruins near the village of Exoge is popularly called the "School of Homer."

ITURBIDE, AUGUSTIN DE, emperor of Mexico, born in Valladolid de Michoacan in 1784 (though another account says 1790), executed in Padilla, July 19, 1824. He was the son of a native of Pampeluna, in Spain, who had settled in Mexico. He entered the militia of his native province at an early age, and served without pay. In 1810 he became a lieutenant in the regular army, at a time when his regiment was in active service against his insurgent countrymen. His activity, energy, and bravery, but particularly the share he had in suppressing the insurrection of Morales, led to his promotion. In 1810 the revolution projected by Don Miguel Hidalgo, curate of Dolores, broke out, and Itur-

bide was tendered the rank of lieutenant-general by the insurgents, but refused it. He exerted himself in putting down the rising, and in reward was made commander of the provinces of Guanajuato and Valladolid, as well as of the army of the north. About this time he was accused by some of the royalists of want of fidelity to the cause in which the army was engaged. He was acquitted of the charge by the viceroys Calleja and Apodaca, but becoming disgusted with the service, he withdrew to his plantation. Subsequently he accepted the command of an army destined to the south, and marched to Acapulco in the latter part of 1819. There he matured a plan, the professed object of which was the emancipation of Mexico from the yoke of Spain, the independence of the country, and the extension of freedom to all orders of people. It has been known as the "Iguala plan," as it was first promulgated to the army then under his command at Iguala (Feb. 24, 1821). The plan proposed was entirely successful. "Without bloodshed, conflagrations, robberies, or depredations," writes its author, in his political life by himself, "nay, without even a misfortune, a single sigh or a tear, my country was rendered happy, and, from a colony, transformed into a great and independent empire." The Europeans who desired to follow the fate of the country retained the situations they held. The public functionaries who wished to withdraw received a fourth part of their pay; and the military who left the country had their expenses paid as far as Havana. This generosity of Iturbide led many to think that he was acting in concert with the royal troops. He now continued his march to Queretaro, and was soon joined by Guadalupe Victoria, the most devoted of the friends of liberty. Meantime the viceroy-general, Don Juan O'Donoju, arrived from Spain, and, finding the whole country virtually with Iturbide, concluded a treaty with him at Cordova, Aug. 24, 1821, acceding to the provisions of the plan of Iguala, which was immediately forwarded to Ferdinand VII. The treaty of Cordova opened the gates of the capital as well as the road to power to Iturbide. On Sept. 27 he entered the city of Mexico, and on the same day the junta of government spoken of in the Iguala plan was formed, and he entered on his official duties. He is charged with having established a regency consisting of members nominated by himself, and wholly under his control; but though selected by him, he states that the choice was not according to his own will, as he "was particularly anxious that all of them should be taken from among those men of all parties who enjoyed the best reputation; the only means under the circumstances of consulting the wishes of the people." The new assembly began to exercise its functions, when Iturbide found that he had divested himself of certain powers without which he could not control it. Then it was that he saw, as he says, "the amount of the sacrifices" he had made. He

"lamented the fate" of his fellow citizens, and believed it was optional with him to resume and concentrate in his own hands the supreme command. The republican party soon discovered the object he had in view, and the congress made various attempts to diminish his power. Two parties now arose, which were afterward known as republicans and Bourbonists, both of which were opposed to Iturbide. The former, he declares, were his enemies because they were convinced that they could never be able to induce him to contribute to the establishment of a government to suit the Mexicans; and the latter, because the Spanish government had disavowed the conduct of Gen. O'Donoju, thereby leaving the treaty of Cordova without effect. The first duty of the congress, after its installation, was to draw up a convocatory address for the assembling of the congress intended to give a constitution to the state. It performed its duty, but disappointed Iturbide, who declared that the representation was unfairly distributed. The elections, however, took place, and the new congress met; but though it existed 8 months, its avowed object, that of framing a constitution, was not accomplished, nor was any other measure of consequence enacted. "The public treasury was exhausted, and nothing was left to pay the army or the public functionaries. There was no established system for the finances, as the one in force during the time of the Spanish government was abolished, and no other established in its place. . . . The administration of justice was abandoned, the tribunals and their dependencies were in a state of dissolution, and yet no measure on this subject did the congress enact. In a word, the country required aid in every respect; but the legislature did nothing efficient for the newborn empire. . . . Not even a set of by-laws for their own regulation did the congress draw up." Toward April, 1822, symptoms of an approaching anarchy were apparent. Congress dismissed 3 of the 4 regents, and declared that the command of the army was incompatible with the duties of a member of the executive power. This was a blow directly aimed at Iturbide; but the commander-in-chief, having bayonets at his disposal, kept the congress in check. On the night of May 18 the people and garrison of Mexico simultaneously proclaimed him emperor. "'Long live Augustin I,' was the universal cry," says the emperor, "that astonished and appalled me." Iturbide drew up a proclamation, which was circulated the following morning, wherein he pointed out the necessity of convening the regency, assembling the generals and chief military officers, forwarding an official notice to the president of the congress, and demanding of him to give orders for an extraordinary meeting. The regency and the army gave in their adhesion, and when the matter was laid before the congress Iturbide received the votes of 74 out of 94 deputies present. The total number entitled to seats was 172. Shortly afterward, the congress declared

the crown hereditary in the family of Iturbide, gave to his sons and father the title of princes, settled upon him a yearly allowance of \$1,500,000, and established an order of knighthood called the order of Guadalupe. The action of the congress seemed to give general satisfaction in the provinces; and there appeared a prospect that the political convulsions which had so long agitated the country would be terminated by this new union under an independent sovereign. But the emperor was not able long to maintain his authority against public mistrust, and the conflicting claims of rival chiefs. On Aug. 26 he caused the arrest of some of the deputies who had been holding clandestine meetings for the purpose of plotting against the government. This involved a quarrel with the congress, and on Oct. 30 he dissolved that body, and established a junta of 45 of the former members, who were to exercise legislative functions in urgent cases. Tranquillity being thus in a measure restored, the emperor turned his attention to the castle of San Juan de Ulloa, the only point still occupied by the Spaniards, while Gen. Santa Anna was in command of the force at Vera Cruz. Complaints having been made against this officer, the emperor determined to relieve him of his place and call him to his court or council. Santa Anna took offence at his removal, aroused the people of Vera Cruz, and proclaimed a republic. He was, however, defeated in his attempts to bring other cities and provinces over to his cause, and took refuge again in Vera Cruz. Here he was besieged by Gen. Echavarri; but after a brief delay, with a few skirmishes, the besiegers and besieged formed a union, known as the convention of Casa Mata, for the purpose of re-establishing the congress which had been dissolved by Iturbide. This act was signed Feb. 2, 1823. Defection now became general among the officers of the army and in the provinces, so that Iturbide, finding his cause hopeless, hastened to the city of Mexico, where he called together the congress, and tendered his resignation of the crown, March 20, 1823. At the same time he requested permission to leave the country, which was granted him, together with a yearly pension of \$25,000. A stipulation was connected with this pension, that he should for ever reside abroad, and in case of his death provision was made for his family. He proceeded to the coast and embarked, May 11, 1823, for Leghorn, where he resided several months, and where he wrote his "Statement," from which many of the facts regarding himself in this article are taken. From Italy he went to England, and on May 11, 1824, embarked for Mexico once more with a view to recover his lost empire, landing in disguise near the port of Soto la Marina, July 14. The Mexican government had been apprised of his leaving Italy, and suspecting his intention, passed a decree, bearing date April 28, 1824, proscribing him as a traitor, and declaring that the mere fact of his landing in the country should render him a

public enemy. The ex-emperor was accompanied by a Pole named Beneski, who applied to Gen. Garza, the commander of the province of Tamaulipas, for passports, pretending that they were for persons who had visited Mexico on a mining speculation. Garza granted a passport to Beneski, but desired to see his companion before granting another. Afraid to show themselves, they set out for the interior with two others; which fact being made known to the general, he had the whole party brought back, when he immediately recognized Iturbide. Garza lost no time in conducting his prisoner to Padilla, and sent to the provincial legislature for instructions. He was ordered to put in execution forthwith the decrea of congress of April 28, by causing Iturbide to be shot. Iturbide in vain solicited a reprieve until the general government could be informed of his situation, and have an opportunity to decide upon his case. At 6 o'clock in the afternoon, having confessed himself, he was conducted to the place of execution. He made a short address to the assembled people, protesting his innocence of any treasonable purpose, exhorting them to observe the duties of patriotism, religion, and civil subordination, and declaring that he pardoned his enemies. He was killed at the first fire. While these events were passing, the wife of Iturbide and two of their children, who had accompanied him, had landed at Soto la Marina. They brought with them proclamations and other papers intended to aid the design of the ex-emperor, together with his imperial mantle and other insignia. As soon as the captain of the vessel learned what had transpired, he cut his cables and put to sea, leaving these people at the mercy of the Mexicans. The conduct of the government toward the unfortunate family was just and liberal. They continued to the widow the pension promised the family at the time of Iturbide's abdication, only annexing the condition that she should reside either in Colombia or the United States. She chose the latter, and has since resided in Philadelphia, where her children were educated. During the last 10 years, two at least of her sons have returned to Mexico, where they were appointed to places of trust by the government.

ITZA, LAKE OF. See GUATEMALA.

ITZAES, a powerful Indian family of Central America, who were found at the time of the conquest established on the islands and shores of Lake Itza, in what is now the district of Peten, Guatemala. They spoke a dialect of the same language with the Mayas of Yucatan, with whom they seem to have been closely affiliated. Tradition reports that when the feudal monarchy of Yucatan suffered a disruption in 1420, in consequence of a coalition of rebel chiefs, one of the powerful *caneks* or princes migrated to the southward with his followers, and after many wanderings fixed his seat on the island of Tayasal, in the lake of Chultuna, now Lake Itza. Here he built a considerable city, and his followers increased so rapidly that, ac-

cording to the chroniclers, they numbered 25,000 souls on the island, beside a large population scattered through the adjacent country. Cortes reached the retreat of the Itzaes in his famous march from Mexico into Honduras in 1525, and has left us an account of their chief and his island capital. He received the Spaniards kindly, and elevated a lame horse which Cortes left with him to the rank of a god. Its image, cut in stone, was found in the temples of Tayasal, when it was destroyed in 1698. Their country being destitute of the precious metals, and remote from the sea, the Itzaes were suffered to retain their independence and isolation for a long period after the entire subjugation of the principal provinces of Central America and Yucatan. But toward the middle of the 17th century various attempts were made to reduce them, all of which they successfully resisted, driving back their invaders in disaster. By a combined attack of the forces of Guatemala and Yucatan, under the command of Don Manuel de Ursua, governor of the latter province, in 1698, they were finally compelled to succumb to the Spanish arms. The whole army, says the chronicler Villagutierre, was employed during a whole day in destroying the temples of the capital alone. Many of the Itzaes now abandoned the country, and took refuge among the still unconquered tribes and remnants of tribes to the eastward, but a considerable number remain among the seats of their ancestors. They are nominally under the government of Guatemala, and are understood to recognize the Catholic faith; but in fact their condition, habits, and practices are not greatly changed from the time of their reduction in 1698.

IVAN (CZARS). See RUSSIA.

IVES, LEVI SILLIMAN, D.D., LL.D., late bishop of the Protestant Episcopal church in North Carolina, born in Meriden, New Haven co., Conn., Sept. 16, 1797. He was brought up on a farm in Turin, Lewis co., N. Y., to which his father had removed. When 15 years old he was sent to the academy at Lowville. His studies here were interrupted nearly a year by his service in the war with England, under Gen. Pike. He entered Hamilton college in the summer of 1816, and began a course of preparation for the ministry of the Presbyterian church, which he had joined in very early life. His diligence in study injured his health, and he left college before the close of his senior year. About this time he was led to new views of the constitution of the Christian ministry, and in 1819 he joined the Protestant Episcopal church. He went to New York at the instance of Bishop Hobart (whose daughter Rebecca he married in 1825), studied theology under his direction, and received deacon's orders at his hands in Aug. 1822. His first services were rendered at Batavia, Genesee co., N. Y., then a missionary station. Thence he went the next year to the charge of Trinity church, Philadelphia, and was ordained to the priesthood by Bishop White. In 1827 he took charge of Christ church, Lan-

caster, Penn.; at the end of the year he became the assistant minister of Christ church, New York; and about 6 months after was made the rector of St. Luke's church in the same city. He served in this place till Sept. 1831, when he was consecrated bishop of North Carolina. He was a very able preacher, and administered the affairs of his diocese with much skill and judgment, winning in a remarkable degree the affection of his clergy. To promote the cause of education in the church, he established an institution at Valle Crucis, among the mountains of North Carolina, which finally exposed him to great pecuniary loss. Soon after his settlement in his diocese he manifested a deep sympathy with the efforts then in progress for the religious training of the slaves, and prepared a catechism adapted to their comprehension and spiritual wants, which was successfully introduced under his own supervision among the slaves on some of the large plantations. Beside various charges to the clergy, and a number of occasional sermons, he published a volume of discourses on the "Apostles' Doctrine and Fellowship," and another on the "Obedience of Faith" (New York, 1849). During the excitement in the Episcopal church caused by the Oxford tracts, he sided strongly with the tractarian movement. Though his diocese was eminently high church, his language and acts touching this movement excited distrust, and the result was alienation. His mind had long unconsciously been tending to the Roman Catholic view of the questions under discussion, and at length he was thoroughly convinced of the supremacy of the pope. In Dec. 1852, he visited Rome, and was there admitted into the Roman Catholic church. Soon after he published a volume in vindication of his change of faith, entitled "The Trials of a Mind in its Progress to Catholicism" (London and Boston, 1854). Since his return to America he has been employed as professor of rhetoric in St. Joseph's theological seminary at Fordham, and as lecturer on rhetoric and the English language in the convents of the sacred heart and the sisters of charity. He has also served as an active president of a conference of St. Vincent de Paul, and occasionally as a public lecturer in some of our large cities.

IVORY (Lat. *ebur*; Fr. *ivoire*), a compact substance, intermediate in character between bone and horn, composing the tusks and teeth of various animals, and admirably adapted, by its close texture, pure whiteness, and susceptibility of receiving a high polish, for the manufacture of a great variety of articles of ornament and use. The tusks of the elephant are the principal source of the article, and furnish that variety, most employed, which displays in its cross section peculiar sets of curved lines, crossing each other under small angles. This appearance being objectionable for some uses, as for artificial teeth, dentists, while organic substances were applied to this use, employed the harder and more compact teeth of the hippopotamus, first removing the thick enamel

that covers them, and which is so hard as to resist steel tools. Other varieties of ivory, generally inferior in quality to that furnished by the elephant, are obtained from the teeth and tusks of the walrus, narwhal, and some other large animals, as also from the masticating teeth of the spermaceti whale. A remarkable source of ivory, which has long supplied the Russian markets, is the vast collection of bones and tusks of extinct species of mammoths and elephants found in the banks of the rivers of northern Siberia. This fossil ivory is of similar quality to that of living animals, and for many years it has been extensively employed not only in Russia, but in the different continental countries of Europe. Holtzapffel speaks of having seen some of these tusks which were 10 feet long, and weighed 186 lbs. each. They were solid from the tips to within 6 inches of the larger end, and the ivory was of fine grain and sound texture.—In commerce the tusks of ivory are commonly known as teeth. Those of the finest and most transparent quality are principally obtained from the W. coast of Africa within 10 degrees of the equator. The E. coast furnishes excellent white ivory, which is mostly taken to Bombay. Small quantities only are obtained at the Cape of Good Hope. From Calcutta, Madras, Singapore, and the various other ports of the East Indies, are shipped the tusks of the Asiatic elephants. Those of Singapore and Ceylon are described as of fine grain, with a pearly bluish appearance, and seldom large. The tusks are of all sizes, from a few ounces in weight to more than 160 lbs. each; the average size is much less than formerly, and is reckoned at only about 9 lbs. each. At this rate it is estimated that more than 22,000 elephants must be annually destroyed to furnish the ivory required by the cutlery establishments of Sheffield alone; and it is a constant wonder that the supplies do not diminish from the enormous demands of this and other markets. The qualities of the ivory differ greatly according to the countries from which it is obtained, and persons much accustomed to inspect it can generally tell its source from its appearance. The African is the most transparent, susceptible of the highest polish, and most free from cracks, which are a common defect of the Asiatic. The latter is of a dead white color within, but more disposed to become yellow by age than the African. The best tusks are nearly straight, and in section nearly circular. One of the largest size has been found to measure $8\frac{1}{2}$ inches on its longer, and 7 inches on its shorter diameter. They are hollow for about half their length, and a line is traced from the termination of the cavity to the tip of the tusk, which marks in the solid ivory the former extension of the cavity. Upon the outside they are coated with a rind $\frac{1}{16}$ to $\frac{1}{3}$ of an inch thick, the color of which in the African varieties may be one of numerous transparent tints of orange, brown, or almost black, and in the Asiatic an opaque fawn or stone color. It conceals the quality of

the ivory within, which may be partially exposed at the worn tip, but is finally ascertained only on the introduction of the saw, which is used to cut up the tusk for use. Even in the interior it is often found to be of variable character, opaque patches appearing in the transparent quality, and the white being sometimes marked in rings alternately light and dark colored. In the larger teeth the grain is often coarse in the outer portion, and becomes fine within; and some varieties are of chalky consistency like bone, and present dark brown spots. The qualities are so variable, that when exact matches are required of several articles it is important to cut them from the same tusk. It is sometimes found that the tusk has been penetrated by a bullet, and injured in its texture for several inches around the foreign body. The eastern potentates are reputed to use sometimes in their hunting bullets of gold and silver, and in two instances in cutting up tusks in England a golden bullet has been found, one of which was worth 17s.—Ivory from different countries varies in the proportions of its ingredients. The African has been found to contain 101 parts of animal matter to 100 of earthy matter, the ivory of the East Indies 76 of the former to 100 of the latter, and some obtained from Egypt 70 to 100. By age a portion of the albuminous matter is dissipated, and the ivory becomes brittle and disposed to crumble. This was the condition of some ancient ivory carvings found by Layard in the ruins of Nineveh. To restore their tenacity Prof. Owen recommended their being boiled in a solution of gelatine. The experiment proved perfectly successful, and the ivory thus regained its original strength and solidity. By dissolving out a portion of the phosphate of lime (the earthy ingredient in its composition), the ivory has been found to retain its form while it became flexible. A Parisian manufacturer of surgical instruments has thus softened tubes, probes, and other instruments of ivory, steeping them, after they had received their shapes, in dilute hydrochloric acid. After drying, the substance becomes hard, but by keeping the articles moist the softness and elasticity they have acquired is restored.—The uses of ivory are very numerous. Holtzapffel speaks of it as working with exquisite smoothness, altogether devoid of the harsh meagre character of bone, and in all respects the most suitable material for ornamental turning, as it is capable of receiving the most delicate lines and cutting and the most slender proportions. In ancient times, the artists of Greece and Rome carved from the tusks of the elephant statues and various works of art, among which those of Phidias are especially famous. The size of some of the statues has led to the opinion that the ancients obtained larger tusks than those of modern times, or that they had a method of softening and flattening out the material, or built it up in plates around a central core. (See Quatremère de Quincy's *Le Jupiter Olympien, ou l'art de la sculpture antique*, Paris, 1815.)

Ivory was also a favorite material for sculpture in the middle ages, and many beautiful specimens then executed are preserved in museums and private collections. Dieppe in Normandy has been for 2 centuries the chief seat of this branch of art in modern times. The Chinese possess extraordinary skill in working ivory, carving out of a solid block a number of hollow balls one within another, all curiously ornamented with various devices. Their chessmen of this material are unequalled in ingenious workmanship by those of any other people. The largest demand for ivory is probably for the handles of knives. The keys of pianofortes and of other musical instruments also consume large quantities of it. Its fine texture and smooth surface recommend it for plates for miniatures; and it is used for a great variety of toys, and of mathematical and other instruments. For drawing scales the material is not found so suitable as box or lance wood, for its dimensions change as it absorbs and gives out atmospheric moisture. Billiard balls are liable to the same difficulty; and as the shrinkage or expansion is greater in the direction of the width of the tusks than in that of their length, the two diameters of the balls are sometimes found to materially differ after they have been made a short time. For this reason they are sometimes roughly shaped, and then kept for months in the room in which they are to be used to acquire the form due to its usual condition as to moisture, when they are at last finished. Small solid tusks of about the diameter of the balls are usually preferred for this use, as least liable to alter in shape.—In cutting up the tusks for use, they are first divided into short blocks, and upon the ends of these lines are traced with a pencil marking the directions for the subdivisions. These are carefully planned, so as to avoid any waste except that arising from the passage of the thin saw employed. Every part is converted to some use; the outside strips, called spills, serve for the handles of penknives and other small objects; the scraps are burned to make ivory black; and the clean saw dust and shavings are sometimes used for making jelly. The pieces are liable to crack and warp when exposed to dry hot air, and they are consequently improved by seasoning; but care should always be used not to expose them to a temperature that would cause wood to shrink and crack. Thin pieces, as the slips for pianoforte keys, are often seasoned by exposing them to a moderate degree of heat in an oven for a few hours. This also has the effect of improving their whiteness by evaporation of the oil contained in the ivory. Veneers are cut out of the blocks either in straight longitudinal slips, or by the method first practised by the Russians upon cylindrical blocks of wood, in a spiral sheet, as if this were unrolled from the cylinder submitted to the operation. In the London exhibition of 1851 a veneer of this kind was exhibited in the United States department, a foot wide and 40 feet long.

In Paris they have been cut in strips of 30 by 150 inches; and a pianoforte has been entirely covered with this material. Ivory is readily colored by different preparations. Billiard balls are dyed red by dipping them in a mordant of nitro-muriate of tin and then in a decoction of cochineal or other red dye; dyes of other colors may be substituted, retaining the same mordant. No good methods are known of restoring its whiteness when this is changed by age.—Various substitutes have been introduced for ivory. The best known is that called vegetable ivory, an albuminous substance formed from a milky fluid in the fruit of a species of palm common in Peru and New Granada, the *phytelephas macrocarpa*. It corresponds to the meat of the cocoanut, the fruit of another species of palm. When the nuts are perfectly ripe and dry, the kernels are hard like ivory and very white. It answers very well for many small articles instead of the genuine ivory, but is more liable to tarnish, and does not wear so well when exposed to friction. The French preparation, known as Pinson's artificial ivory, is a compound of gelatine and alumina. Slabs or tablets of gelatine or glue are immersed for some time in a solution of alumina in acetic or sulphuric acid. The alumina separates and becomes incorporated with the glue, and the plates are then removed, dried, and finally polished. Another preparation of artificial ivory is made by working together bone or ivory dust with an equal portion of albumen or gelatine to form a paste, and then rolling this into sheets, and hardening them by drying. Sulphate of barytes finely powdered is used to advantage with one half its quantity of albumen. Tablets thus prepared are used in photography to receive positive pictures.—**IVORY BLACK**, prepared by calcining the shavings and dust of ivory, is ground and levigated on a porphyry slab to produce the beautiful velvety black material, which forms the chief ingredient of the ink used in copperplate printing. (See **BONE BLACK**.)

IVORY, JAMES, LL.D., a Scottish mathematician, born in Dundee in 1765, died near London, Sept. 21, 1842. At the age of 14 he was sent to the university of St. Andrew's, where he studied for 6 years, and completed his professional course in theology. Instead of becoming a licentiate, he accepted a position as teacher in the academy of Dundee, where he remained 3 years. He was afterward for 15 years superintendent of a flax-spinning factory at Douglastown, which resulted in a failure in 1804. Meantime he pursued his mathematical studies, and became known by remarkable memoirs read before the royal society of Edinburgh. In 1804 he was appointed to the professorship of mathematics in the royal military college at Marlow, Buckinghamshire (afterward removed to Sandhurst), from which he retired with a pension in 1819, and from that time he prosecuted his favorite studies in the vicinity of London. He had been elected a member of the principal learned societies of England and Germany,

when in 1831, on the recommendation of Lord Brougham, he received an annual pension of £300. His principal writings are papers in the "Transactions" of the royal societies of Edinburgh and London. Three of these were on the attractions of the spheroids, and contained a process of analysis which was acknowledged by Laplace to be superior to his own.

IVORY COAST. See GUINEA.

IVY, a plant common in Europe, and introduced for purposes of ornament into America. It is known to botanists as the *hedera helix*, the specific name implying its habits of spirally ascending and firmly affixing its stems to trees and walls over which it spreads. The ivy is ranked among the ginseng family or *araliaceae*, presenting in the style of flowers very much the same characters as the *umbelliferae*, but having unlike them for fruit a 3 or several celled drupe. The fruit of the ivy is of a black color, unfit for the food of man, being bitter, aperient, and emetic, but it is eaten by birds; deer and sheep will devour its leaves, although they have a harsh and bitter taste. In medicine the ivy has been recommended as a sudorific, and in the plagues with which London was visited an infusion of the fruit in vinegar was thought to be serviceable. It was once supposed to prevent drunkenness and to dissipate the effects of wine; and it composed the crown of the poet and the bacchanalian fillet. There are several varieties of common ivy. The Irish or giant ivy was formerly regarded as a distinct species under the name of *hedera vegeta*; but it was probably nothing but a variety. This form occurs however in a wild condition in Madeira. Where the ivy grows in warmer districts, an exudation called ivy gum is to be found upon its older stems; this when burned throws out an agreeable odor, and is sometimes substituted for gum Bassoral. Medicinally this ivy gum, or rather resin, is reputed to be a stimulant and emmenagogue. The cultivation of the ivy is easy, being raised from cuttings, which are to be planted in the autumn in sandy soil and shaded, or perhaps in pots or in frames where the young plants may have some protection from the cold of the first winter. They should have good roots before being planted out; and even then they should be supplied with rich soil and not again removed. In the United States a north wall seems most favorable, and in New England, in the neighborhood of Boston, protection by mats through the winter has been employed. Under favorable circumstances the growth of the ivy is very rapid; the bare rear walls of greenhouses, for instance, may be soon rendered ornamental and pleasant to the eye. From the sides of the stems numerous radicles proceed, which have a tendency to cling to the mortar or fix themselves to any interstices between the bricks. Sometimes it is found to be a good plan to train the main stems to a trellis fastened to the wall, or even to nail them to the masonry work after the manner of wall fruit trees. In England, the ivy is trained upon old

trees and grows to a great size, attaining the height of 100 feet, and having trunks of from 10 to 12 inches diameter, while some have been known of still greater size. The ivy in Great Britain only blossoms when it has reached its extremest growth, as when it has climbed to the summit of the tree to which it has affixed itself, and thus become exposed at last to the influence of the sun's direct rays. At this period its branches shorten themselves and become woody, forming large bushy heads; the leaves are no longer elegantly 5-lobed, but are entire in their outline, taking indeed a somewhat oval shape. The flowers are of a yellowish or greenish white color, appearing at the end of September and continuing through October and November; they are odoriferous, and attractive to the bees and to other insects. The berries, which succeed, continue to increase in size through the winter, ripening in April, and are then eagerly sought for by various kinds of birds. When fully ripe, these berries are succulent with a purplish juice, but they afterward become coriaceous, dry, and shrivelled into somewhat 5-angled shapes, harmonizing with the contour of the lower leaves. The seeds resemble swollen grains of wheat. Several beautiful varieties of the ivy are known to the florists, such as those with silver-striped and golden-striped leaves. The effect produced by the foliage of a golden-leaved variety is very superb, the new leaves in the spring of the year looking from a little distance like immense masses of yellow flowers. The use of the ivy for an ornamental vine in the drawing room or in the parlor is well known; but it can be equally used for the purpose of a summer screen in front of a balustrade or of a window, by planting some roots of it in large vases or in ornamental boxes, and then training the growing stems and branches upon wire frames; such plants, if necessary, can be removed to the cellar or some other place for protection from the winter's cold. The chief requisite to vigorous growth in the house seems to be a rich soil and abundant moisture; watering the growing plants frequently with weak liquid manures promotes luxuriance; the richness of the foliage may be preserved by taking care to wipe off any dust from its surfaces with a piece of dry woollen cloth. The geographical distribution of the ivy seems to be from the south of Sweden to the Mediterranean sea, and from Ireland to Siberia. It occurs in the north of Africa, in the west of Asia, in the mountainous regions of India, in Japan, and in China; but is not found either in North or South America or in Australia. A creeper with smooth and succulent stems, and fleshy, light green leaves, without fibrous, aerial rootlets, known as German ivy, and much cultivated for beauty, is of another family, and belongs to the *sencionideæ*, or groundels.

IXION, a mythical Thessalian prince, king of the Lapithæ, and father of Pirithous. When Deïoneus, whose daughter Dia he had espoused, demanded of him the customary bridal gifts,

Ixion treacherously invited him to a banquet, and then had him cast into a pit filled with fire. None would hold intercourse with the murderer, or purify him, till Jupiter at length took pity on him, performed the necessary rite, and made him his guest. But this kindness begot no corresponding gratitude in the breast of Ixion, who even presumed to make love to Juno, the wife of Jupiter. The latter made a phantom resembling Juno, by which Ixion became the progenitor of the centaurs. For his impiety he was chained by Mercury to a wheel which revolved perpetually in the air.

IXTLAVICAN, SANTA CATARINA DE, a large and remarkable Indian town in the department of Quesaltenango, Guatemala. Its inhabitants admit no whites among them except a priest, and retain most of their aboriginal customs.

IXTLILXOCHITL, FERNANDO DE ALVA, an Indian historian, descended in a direct line from the kings of Tezcuco in Mexico. He flourished in the beginning of the 16th century. He was interpreter of the native languages to the viceroys of Mexico, and assiduously collected the ancient MSS. and traditions of his country, which he embodied in a series of memoirs or "Relations." His most important work is a "History of the Chichimecas," which, with most of his other writings, was first printed from the MSS. in Mexico, by Lord Kingsborough ("Mexican Antiquities," vol. ix.). His works evince a disposition to over-estimate the power and policy of the Tezucan kings, but are nevertheless interesting, and on the whole trustworthy.

IZALCO, a volcano in the republic of San Salvador, Central America, in lat. 13° 15' N., long. 89° 44' W. It is in many respects the most interesting volcano on the American continent, and the only one, with the exception of that of Jorullo in Mexico, which is known to have originated within the historical period. It is in a state of constant eruption, and, being visible from the sea for a long distance, is known among sailors as *el faro del Salvador*, the lighthouse of the Saviour. It stands near the base of the great extinct volcano of Santa Aña, on which, previously to 1770, was a vast cattle estate. Near the close of 1769 the dwellers on the estate were alarmed by subterranean noises accompanied by shocks of earthquake, which continued to increase in loudness and strength until Feb. 23, when the earth opened about half a mile from the dwellings on the estate, sending out lava, accompanied by smoke and fire. The inhabitants fled, but the herdsmen, who visited it daily, reported a constant increase in the smoke and flames, and that the ejection of lava was at times suspended, and vast quantities of ashes, cinders, and stones sent out instead, forming an increasing cone around the vent or crater. This process was continued for a long period, the cone gradually rising in height from the aggregations. Finally lava ceased to flow, and the accumulations have since been entirely from the ashes and stones thrown out from the crater, until the mountain

has reached a height of upward of 4,000 feet, or nearly that of Vesuvius. Its explosions occur with great regularity at intervals of from 10 to 20 minutes, with a noise like the discharge of a park of artillery, accompanied with a dense smoke and a cloud of ashes and stones. At night the cloud of smoke and ashes is lit up at the base with a lurid glow, like that which hovers over the mouth of a furnace, and is traversed in every direction by tongues of flame, supposed by the people of the adjacent country to be lightning. The red-hot stones rise above all like meteors, poise themselves for a moment against the sky, and then, falling, roll down the sides of the mountain in luminous tracks. Occasionally a little stream of lava, resembling molten iron, will rise over the edge of the crater, and exhibit in cooling a variety of shades and colors. Being in full view of the city of Sonsonate, it is a source of constant interest to the inhabitants. The people of the Indian town of Izalco, however, which stands within a mile of its base, look upon it with constant apprehension. The throes which attended its birth occasioned much damage to their public edifices. Izalco, although a separate mountain, must be regarded as a new vent for the gigantic volcano of Santa Aña (called anciently Izalco), which is the centre of a cluster similar to Izalco, and probably formed in like manner, but which are now extinct. Among them may be mentioned the volcanoes of San Marcillino, Naranjo, Tamasique, Aguila, San Juan, Launita, and Apaneca, the last named elevated 6,000 feet above the sea. Lately (Dec. 1859), the volcano has broken out with unwonted violence, and its eruptions have been accompanied with earthquakes, occasioning much damage throughout the adjacent country, but more particularly in the town of Izalco and city of Sonsonate.

IZALCO, a town of San Salvador, Central America, situated near the base of the volcano of the same name, 8 m. N. of the city of Sonsonate; pop. 5,000, chiefly Indians, many of whom still retain their native language, which is Mexican or Nahuatl. In former times it was the centre of the most important cacao-growing district in all America. It has many evidences of past importance. Its fine large church was nearly destroyed by the earthquake of Dec. 8, 1859. The country around it is remarkably fertile and well watered.

IZARD, a N. co. of Ark., drained by White river, which is here navigable; area, 864 sq. m.; pop. in 1854, 4,148, of whom 200 were slaves. It has an uneven surface and a fertile soil. The productions in 1854 were 239,017 bushels of Indian corn, 9,122 of wheat, 25,132 of oats, and 306 bales of cotton. In 1850 it had 3 churches, and 195 pupils attending public schools. Capital, Mount Olive.

IZARD, RALPH, an American statesman, born near Charleston, S. C., in 1742, died at South Bay, May 30, 1804. He was educated at Christ's college, Cambridge, England, and, inheriting an ample fortune, established himself in 1771 with

his family in London, whence the troubled condition of American politics induced him in 1774 to retire to the continent. He subsequently endeavored to impress upon the British ministry the ill-advised nature of the course they were pursuing, but without effect. In 1780 he returned to the United States, and found occasion to serve the country in various ways, having been instrumental in procuring the appointment of Gen. Greene to the command of the southern army, for which he received the thanks of the governor of South Carolina, and having once pledged his whole estate as security for funds needed in the purchase of ships of war in Europe. In 1781 he entered the continental congress, of which he remained a member until the peace; and upon the adoption of the federal constitution he was elected a U. S. senator from South Carolina. He was polished in manners, and as a legislator able and eloquent. Washington, of whose administration he was a faithful supporter, had the highest opinion of his public integrity, and in the senate he possessed the confidence of all parties. The "Correspondence of Ralph Izard from 1774 to 1804, with a Short

Memoir," was published by his daughter (Boston, 1844).—GEORGE, an American general, born in South Carolina in 1777, died at Little Rock, Ark., Nov. 22, 1828. He received a classical education, and after a tour in Europe was appointed in 1794 a lieutenant in the regiment of artillerists and engineers in the U. S. army. In 1803, being then a captain of artillery, he resigned his commission. Upon the breaking out of the war of 1812 with Great Britain he was appointed colonel of the 2d artillery, and was successively promoted to be brigadier-general and major-general. At one period of the war he held chief command on the N. W. frontier. He was disbanded in 1815, and in 1825 became governor of Arkansas territory, in which office he died.

IZTACIHUATL, a volcano of Mexico, 14,736 feet above the sea, not far from that of Popocatepetl, in the neighborhood of the city of Puebla. It is sometimes called the Sierra Nevada, its top being always covered with snow. Its name is aboriginal Mexican, from *iztae*, white, and *cihuatl*, woman. It has not been active since the conquest.

J

J, the 10th letter of the English, French, German, Italian, Spanish, and some other European alphabets, is a spurious and protean counterpart of the letter I. It is also called the consonant of that vowel, fulfilling that function of the original letter when it precedes another vowel. This, however, is the case only where it sounds like *y* in *yet*; for in some European languages it is either a superfetation of other legitimate letters, or the representative of sounds which have nothing in common with that of its prototype, I. It is in German miscalled *jot* (pronounced *yot*), in Spanish *jota* (pronounced *hota*), from *uota*. The following are the sounds with which it is uttered in various languages: 1. As consonant I in Italian, German, Danish, and other Teutonic languages, in Lusatian, Polish, Magyar, &c., where the Cechs use *g*, the Spaniards and English *y*, before vowels; for instance: Ital. *ajuto* or *aiuto*, aid; Germ. *Joch*, yoke, *ja*, yes; Lusat. and Pol. *jeden* (Cechic *geden*), one; Magyar *jég*, ice, &c. 2. The French and Portuguese J, a lingui-dental sibilant, the weak and sonorous counterpart of *ch* (Eng. *sh*), like the sound of *s* and *z* in the English words *pleasure*, *grazier*; produced by the utterance of the breath through the interstice between the tip of the tongue and the front part of the palate and the upper teeth, while the larynx resounds. This sound is also written with *g* before *e* and *i* in Portuguese and French. It is represented by *zs* or *'s* in Magyar; by *ž* in Polish, Cechic, Lusatian, &c. It is one of the Zend sibilants; it is written in Persian and Turkish with the Arabic 11th letter, marked with 2 additional points; in Russian

with the 7th letter, *živiete*; with the 22d Amharic, 10th Armenian, 19th Georgian, &c. There is no such sound in Sanscrit, Greek, Latin, Hebrew, Arabic, Ethiopian, Irish, German, and many other languages. 3. The English J represents the preceding sound intimately combined with that of *d*, as if *dj* were written in French. Its organic formation is composed of the utterance of these 2 sounds. This compound sound is also written in English with *g* before *e*, *i*, and *y*, in Italian with *g* before *e* and *i*. It is written in the Devanagari with the 3d palatal, in Arabic with the 5th letter, in Amharic with the 25th, in Armenian with the 27th, in Georgian with the 36th, &c. This sound is unknown in the ancient Greek, Latin, Hebrew, Ethiopic, and Irish, as well as in Magyar, German, and some other modern languages. 4. In Spanish it is sounded like the German *ch*, as *joven* (pron. *hoven*), young, &c., and is equivalent to *g* before *e* and *i*, and to *x* in some cases, so that Mexico is also written Mejico and Megico. Owing to this intricate variety of representation, as well as to the presence or absence of certain sounds in different tongues, as graphically noted by the letter in question, or by its equivalents, a great deal of needless perplexity arises in speaking and writing correctly the same original element. Thus we have 8 letters of the English alphabet employed to represent J, viz.: *i, j, y, g, h, d, s, z*; and, as *g* and *h* are congeners of *k* or *c*, and as the English sometimes employ *s* and *z* in place of the etymic *c* (as in *pleasure*, *crozier*, from Lat. *placere*, *crux*, *crucis*), 10 letters are misapplied in rendering the elementary I.—The use

of the tailed or elongated J was introduced by Dutch printers, and was long called *I Hollandais* by French printers. It bears the same relation to I as the new W does to V.

JABIRU, a large wading bird of the stork family, found in South America and Africa, of the genus *mycteria* (Linn.). The bill is about a foot and a half long, and strong, resembling that of the stork except that it is bent a little upward at the point. It is a large bird, measuring between 5 and 6 feet in length; the wings are long and ample, with the 2d and 3d quills longest; tail moderate and broad; tarsi much longer than the middle toe, and covered with reticulated scales; the toes are long, united at their bases, with most of the hind toe resting on the ground. Only 2 species are described by Gray, of which the best known is the American jabiru (*M. Americana*, Linn.); in this the bill is black, the head and about two thirds of the neck bare and blackish, and the lower part of the neck bright red; there are a few white feathers on the hind head, and the rest of the plumage is white. It inhabits Brazil and Guiana, frequenting swamps, seeking for fish and reptiles; it rises slowly to a great height, supporting itself for a very long time. The nest is made on lofty trees, and the eggs are generally 2; the young are fed with fish; the flesh of the young is tender and tolerably good eating. The African species (*M. Senegalensis*, Shaw) is an equally large bird, of a generally white color, with head, neck, and scapulars black; it has 2 pendent wattles at the base of the bill.

JABLONSKI, PAUL ERNST, a German orientalist, born in Berlin in 1693, died in Frankfurt-on-the-Oder, Sept. 13, 1757. Having completed his education with the aid of the government, which supplied him with the means of travelling abroad, he was appointed pastor of the Protestant church of Liebenberg, and subsequently professor of theology at the university of Frankfurt, and head minister of the Calvinistic church in that city. He published no fewer than 50 different works on oriental philology, history, divinity, and antiquities, the merits of which are still highly appreciated by competent critics. The most important of these is his *Pantheon Egyptiorum, sive de Diis eorum Commentarius, cum Prolegomenis de Religione et Theologia Egyptiorum* (Frankfort, 1750-'52).

JACAMAR, a diurnal fissirostral bird of the kingfisher family, and sub-family *galbuline*, comprising the 2 genera *galbula* (Möhr.) and *jacamerops* (Cuv.). The plumage is brilliant, green predominating, and the habitat is tropical South America and some of the West Indian islands. In the genus *galbula* the bill is long, slender, straight, pointed, and 4-sided; the wings are moderate and rounded, with the 4th quill longest; the tail elongated and graduated; tarsi very short, slender, and nearly covered with feathers; the toes 2 before and 2 behind, the inner hind one very small (in some species wanting), and the outer anterior one the longest. About 10 species are described, inhabiting the

moist forests, and leading a solitary life; they perch on naked branches, whence they dart in pursuit of insects, in the manner of the bee-eaters; some species are said to feed on fish and their fry. The nest is a hole in a tree or a river bank, with a small entrance, and the eggs are usually 3 in number. The green jacamar (*G. viridis*, Lath.) is about the size of a lark, of a brilliant glossy green, with white chin and rufous abdomen; the paradise jacamar (*G. paradisea*, Linn.), with the same metallic green color, has a violet-brown head, and white throat, front neck, and under wing coverts. In *jacamerops* the bill is shorter, broader, and more curved, more like that of the bee-eaters. The species are few, inhabiting tropical South America, with habits similar to those of the preceding genus. The great jacamar (*J. grandis*, Gmel.) is about 11 inches long, of a coppery green above, and beneath ferruginous.

JACANA, a wading bird of the family *palamedeidae*, and sub-family *parrinae*, of which the principal genus is *parra* (Linn.), found in the warmer parts of America, Asia, and Africa. The bill is long, slender, straight at the base, and vaulted at the tip; the base of the bill has a large, naked, dilated plate, standing up in front of the forehead; wings long, with the 3d quill the longest; tail very short, partly concealed by the coverts; tarsi long, naked, and slender, with transverse scales. The most remarkable peculiarity is the great length of the toes, 4 in number, entirely separated, and all armed with long, straight, and sharp claws; that of the hind toe in the common species is so acute and long as to obtain for the bird the name of "surgeon;" in some the naked plates about the bill descend toward the neck. These birds frequent marshes, sides of rivers, and ponds, in pairs or in small flocks; they are shy, when alarmed diving or skulking among the reeds; by the length of their toes they are enabled to walk upon the floating leaves of water plants, in search of aquatic insects, buds, and seeds; they are quarrelsome and noisy, striking each other with their spurred wings; the flight is rapid, straight, and not very elevated; they wade into the water as far as the knees, but do not swim, as their feet are not webbed; they are monogamous, the females making a nest among the reeds, and depositing 4 or 5 eggs. More than a dozen species are described, of which the best known are the chestnut jacana (*P. jacana*, Linn.), of a black color with a red mantle, with the primaries green, a native of South America; the Indian jacana (*P. Indica*, Lath.), of a blackish color, with blue and violet reflections, bronzed green mantle, rump and tail sanguine red, anterior quills green, and a white stripe behind the eye; and the African jacana (*P. Africana*, Gmel.), with wings unarmed, and forehead not carunculated and greenish black. They are about 10 inches long. The genus *hydrophasianus* (Wagl.) has very long wings, with the shafts of the first 3 quills prolonged, and the ends of the 4th to

the 7th lengthened, narrowed, and falcated; the tail narrowed, with the 4 central feathers much prolonged and the lateral ones short and graduated; the base of the bill and head entirely covered with feathers. To this genus belongs the Chinese jacana (*H. Sinensis*, Gmel.), the only species described by Gray; the habits are the same as in the preceding genus. The general color is brown, with the head, throat, front neck, and wing coverts white; hind neck with golden silky plumes; the long tail feathers black.

JACKAL, a species of wild dog, living in troops in the warmer parts of Asia and Africa, generally placed in the genus *canis* of authors, but raised to a genus of its own (*sacalis*) by Hamilton Smith. These animals live under great varieties of climate, in the moist jungles of Asia, the dry deserts of northern Africa, in forest and plain, and wherever the warmth is sufficient; like other dogs, they are voracious, feeding with avidity even on decomposing matter, and in this way, with the hyæna and vulture, are of considerable advantage to man in hot climates. They are generally harmless, but make night hideous by their dismal howlings; they dwell in burrows which they excavate themselves, and in caves; they are said to disinter dead bodies, and occasionally, when pressed by hunger, to attack man. Though exceedingly timid, they are easily tamed, and rarely snarl at the hand which caresses them; this character gives great probability to the opinion that the jackal has mingled its blood in many of the races of our domestic dogs, though perhaps not to the assertion of Pallas that it is the chief original of this useful animal. The organization of the jackal does not differ from that of the dog, and the habits of digging, living, and hunting in troops, and feeding on carcases, are the same in both in the wild state; the former, at least in some of the species, possesses a disagreeable odor from which the latter is free. The pupil of the eye is round, as in the diurnal canines; the nostrils open on the end of the muzzle; the ears are pointed, with a tubercle on the external edge; the tongue is very soft, and the upper lip and sides of face provided with bristly whiskers; the feet are 4-toed, with a rudiment of a 5th on the anterior on the inner side, and the nails are short and thick; the dentition, habits, movements, and instincts are those of the dogs; the hair is thick, the tail being nearly as bushy as that of a fox. The jackal is often seen in attendance on the lion, and has been supposed to run down his prey for the king of beasts, contented with a small share for himself; hence the name has been applied to persons who voluntarily perform mean services for the rich and great, satisfied with the occasional and contemptuous notice vouchsafed to their cringing officiousness; but the jackal is maligned, as indeed perhaps are its human imitators, for it follows for the sake of the pickings and stealings in the train of his feline majesty; and perhaps the latter is often led to his prey by the howlings of a troop of jackals hunting

for themselves. The common jackal or jungle koola of India (*canis aureus*, Linn.) is of the size of a small dog, reddish gray above, darkest on the back, and lighter beneath; the tail is bushy and dark at the end. It inhabits the warmer parts of S. Asia, N. Africa, and S. E. Europe. The African jackal or dieb (*C. anthus*, F. Cuv.) is of a yellowish gray above, lighter beneath; the tail yellow, with a longitudinal black line at the base, and some black hairs at the tip. It is found in Egypt, Nubia, Senegal, and other parts of Africa. The black-backed jackal (*C. mesomelas*, Gmel.), from the Cape of Good Hope, is fulvous brown above, with a large triangular patch of black broad at the shoulders and ending in a point near the tail; there are a few white spots, the flanks are reddish, and the under parts white; the tail is longer than in other species, reaching nearly to the ground, and the ears are considerably larger. The average height of the jackal is about 15 inches, the length of the body 14 inches, and of the tail about 10 inches. The first two species have been known to breed together, producing 5 young after a gestation of about 60 days; and they will also intermix with domesticated dogs; in fact the agency of the jackal in the production of the southern dogs can no more be doubted than that of the wolf in the case of the northern, and the crossings of these jackal dogs and wolf dogs, either by accident or design, would explain satisfactorily a great number of our domestic varieties. (See Dog.)

JACKDAW, a European coriostiral bird of the crow family, and genus *corvus* (*C. monedula*, Linn.). The form is more compact and graceful than that of any other British corvine bird; of about the size of the domestic pigeon, with large head, short neck, ovate body, and moderate wings, tail, and feet; the bill is shorter than the head, stout and conical, slightly arched, and sharp-edged; the gape almost straight; the plumage full and soft; the tail straight, of 12 broad, rounded feathers; claws arched and strong. The length is about 15 inches, the bill $1\frac{1}{2}$, and the alar extent 30 inches; the female is slightly smaller. The bill and feet are black, irides grayish white, upper and fore part of the head black with bluish purple reflections; grayish black about the eyes and throat; back and sides of neck bluish gray; rest of plumage grayish black, approaching leaden gray on the under parts; wings and tail black, the latter with the primaries glossed with green, and the secondaries with purple. In rare instances, individuals have been found variegated with white. It is a very active, impertinent, playful, and loquacious bird, altogether the most agreeable and sociable of the crows. The flight is rapid, very irregular, and generally accompanied with frequent cries. It dwells in ruined buildings, towers, steeples, and retreats in high rocks, and is often found in the heart of large cities; it nestles in the same places, and occasionally in chimneys, making a large nest, and laying about 5 bluish white eggs with brown or pale purple spots at the larger

end, $1\frac{1}{2}$ by 1 inch; the eggs are laid in May, and the young are abroad by the end of June. Sallying from their retreats at early dawn, they betake themselves to the fields in search of worms, larvæ, and insects, walking about gracefully, but frequently quarrelling; they also eat mollusks, crustacea, fishes, and even carrion; when feeding, they are very vigilant; they pick up food from the streets with the rooks and pigeons, and possess the corvine propensity to carry to their nests all kinds of objects which can serve for their structures, and to steal shining articles of value; they may be taught many tricks, and to pronounce words. They inhabit Great Britain and most parts of the European continent; species in Asia are very nearly allied to this both in appearance and habits.

JACKSON, the name of 18 counties in the United States. I. A N. W. co. of Va., separated from Ohio by the Ohio river, and drained by Sandy and Big Mill creeks; area, 480 sq. m.; pop. in 1850, 6,544, of whom 52 were slaves. It has a diversified surface; the soil near the rivers is fertile, and elsewhere well adapted to grazing. The productions in 1850 were 257,242 bushels of Indian corn, 16,630 of wheat, 43,324 of oats, 31,028 lbs. of wool, 7,832 of tobacco, and 98,561 of butter. There were 14 grist mills, 12 saw mills, 3 churches, and 1,350 pupils attending public schools. Capital, Ripley. II. A S. W. co. of N. C., bordering on S. C., and separated from Tenn. by the main ridge of the Alleghany mountains; area, about 1,000 sq. m. The Blue Ridge occupies its S. E. frontier, and the surface is generally mountainous. The soil produces grain and pasturage. The sources of Seneca and Little Tennessee rivers are in this county. It was formed from parts of Haywood and Macon counties in 1850. III. A N. co. of Ga., drained by the head waters of Oconee river; area, 432 sq. m.; pop. in 1852, 10,018, of whom 3,121 were slaves. It is a hilly and not very fertile district, abounding in granite and quartz, and containing also some iron ore. The productions in 1850 were 309,272 bushels of Indian corn, 49,866 of sweet potatoes, and 1,202 bales of cotton. There were 4 grist mills, 6 saw mills, 14 churches, and 217 pupils attending public schools. Capital, Jefferson. IV. A N. W. co. of Fla., bordering on Ala., and separated from Ga. on the E. by the Chattahoochee river, which unites with the Flint to form the Appalachicola on the S. E. border of the county; area, 920 sq. m.; pop. in 1850, 6,639, of whom 3,534 were slaves. It has a level surface, partly covered with pine forests. The soil near the streams is very fertile. The productions in 1850 were 227,582 bushels of Indian corn, 43,770 of sweet potatoes, 4,744 bales of cotton, 50,490 lbs. of rice, and 14,202 of tobacco. There were 12 churches, and 1 newspaper office. Capital, Marianna. V. A N. E. co. of Ala., bordering on Tenn., and intersected by Tennessee river; area estimated at 975 sq. m.; pop. in 1850, 14,088, of whom 2,295 were slaves. It has a mountainous sur-

face. The soil, drained by numerous streams, is generally fertile. The productions in 1850 were 796,201 bushels of Indian corn, 72,016 of oats, 43,652 of sweet potatoes, and 2,382 bales of cotton. There were 25 churches, 1 newspaper office, and 453 pupils attending public schools. Capital, Bellefonte. VI. A S. E. co. of Miss., bordering on Ala. and the gulf of Mexico, and intersected by Pascagoula river; area, 1,175 sq. m.; pop. in 1850, 3,196, of whom 825 were slaves. The soil is sandy and not fertile, and pine forests cover a large part of the surface. The productions in 1850 were 29,848 bushels of Indian corn, 29,669 of sweet potatoes, and 113,975 lbs. of rice. There were 5 grist mills, 6 saw mills, 14 churches, and 114 pupils attending public schools. Capital, Jacksonborough. VII. A N. parish of La., drained by branches of Washita river; area, 760 sq. m.; pop. in 1855, 8,079, of whom 3,415 were slaves. It has a moderately uneven surface, and a soil generally of good quality. It produced in 1855, 224,022 bushels of Indian corn, and 6,000 bales of cotton. Capital, Vernon. VIII. A S. E. co. of Texas, bordering on Lavacca bay, and drained by Lavacca, Garcitas, and other small rivers; area, 852 sq. m.; pop. in 1858, 1,821, of whom 824 were slaves. The surface is level and occupied chiefly by prairies, although there are undulating timber lands near the rivers. The soil is fertile and suited to sugar cane. The productions in 1850 were 30,600 bushels of Indian corn, 8,454 of sweet potatoes, 290 bales of cotton, 31 hhds. of sugar, and 26,240 lbs. of butter. Capital, Texana. IX. A N. E. co. of Ark., bounded W. by Black and White rivers; area, 980 sq. m.; pop. in 1854, 4,115, of whom 1,017 were slaves. It has a level surface, covered in many places with valuable ash and cypress timber, and a fertile soil. The productions in 1854 were 172,596 bushels of Indian corn, 750 of wheat, 415 of oats, and 2,899 bales of cotton. In 1850 there were 5 grist mills, 3 saw mills, and 125 pupils attending public schools. Capital, Elizabeth. X. A N. co. of Tenn., bordering on Ky., and intersected by Cumberland river; area, 666 sq. m.; pop. in 1850, 15,673, of whom 1,558 were slaves. The surface is much diversified. The productions in 1850 were 805,737 bushels of Indian corn, 56,288 of oats, 36,088 of sweet potatoes, 432,114 lbs. of tobacco, and 177,310 of butter. There were 11 churches, and 6,377 pupils attending public schools. Capital, Gainesborough. XI. A S. co. of Ohio, drained by Little Scioto river; area, 400 sq. m.; pop. in 1850, 12,721. It is rich in coal, iron, marble, and salt. The surface is hilly, and the soil fertile. The productions in 1850 were 316,337 bushels of Indian corn, 74,790 of oats, 7,184 tons of hay, and 131,712 lbs. of butter. There were 16 churches, 2 newspaper offices, and 4,082 pupils attending public schools. The Scioto and Hocking valley railroad passes through Jackson, the capital. XII. A S. co. of Mich., drained by the head waters of Grand, Kalamazoo, and Raisin rivers;

area, 720 sq. m.; pop. in 1850, 19,431. The surface is undulating and diversified by many small lakes. The soil is a good sandy loam. The productions in 1850 were 270,112 bushels of Indian corn, 486,616 of wheat, 178,334 of oats, 168,516 of potatoes, 28,464 tons of hay, and 143,876 lbs. of wool. There were 22 churches, and 2 newspaper offices. The county contains bituminous coal, iron, limestone, and sandstone. The Michigan central railroad passes through Jackson, the capital. XIII. A S. co. of Ind., drained by Driftwood fork of White river; area, 544 sq. m.; pop. in 1850, 11,047. It has a level or undulating surface, and contains beds of iron ore. The soils are of various qualities, some parts of the county being very fertile. The productions in 1850 were 949,174 bushels of Indian corn, 38,464 of wheat, 75,752 of oats, 24,323 lbs. of wool, and 2,458 tons of hay. There were 15 grist mills, 7 saw mills, 28 churches, 1 newspaper office, and 1,154 pupils attending public schools. The Ohio and Mississippi and the Jeffersonville railroads pass through the county. Capital, Brownstown. XIV. A S. W. co. of Ill., separated from Mo. by the Mississippi river, and drained by Big Muddy river; area, 576 sq. m.; pop. in 1855, 7,534. It contains extensive coal beds, and several salt springs. The surface is uneven, and diversified by prairies and timber lands. The productions in 1850 were 273,050 bushels of Indian corn, 22,354 of wheat, and 30,104 of oats. There were 8 churches, and 1,050 pupils attending public schools. The Illinois central railroad passes through the county. Capital, Murphysborough. XV. A W. co. of Mo., bordering on the Indian territory, and bounded N. by the Missouri river, which receives the Kansas at its N. W. extremity; area, 525 sq. m.; pop. in 1856, 17,071, of whom 3,858 were slaves. The surface is moderately uneven. Limestone is the principal rock. The soil is well watered and very fertile. The productions in 1850 were 938,309 bushels of Indian corn, 55,856 of wheat, 124,363 of oats, 798 tons of hay, and 361 of hemp. There were 20 grist mills, 9 saw mills, 14 churches, 2 newspaper offices, and 1,195 pupils attending public schools. Capital, Independence. XVI. An E. co. of Iowa, separated from Illinois by the Mississippi river; area, 628 sq. m.; pop. in 1859, 17,710. It contains valuable mines of lead and iron, is well watered, fertile, and well timbered, and has an uneven surface. The productions in 1859 were 507,871 bushels of Indian corn, 185,364 of wheat, 103,243 of oats, 33,773 of potatoes, 15,002 tons of hay, and 279,945 lbs. of butter. Capital, Bellevue. XVII. A new S. W. co. of Minnesota, bordering on Iowa; area, 750 sq. m.; pop. in 1857, 50. XVIII. A new S. W. co. of Oregon, bordering on California and the Pacific ocean; area estimated at 3,500 sq. m.; pop. in 1858, 1,500. It is bounded E. by the Cascade range, and drained by Rogue and Umpqua rivers.

JACKSON. I. The capital of the state of Mississippi and of Hinds co., on the right bank

of Pearl river, 45 m. E. from Vicksburg, at the intersection of the southern Mississippi and the New Orleans, Jackson, and great northern railroads; pop. in 1850, 1,881; in 1855, about 3,000; in 1859, 3,500. It is regularly built on level ground, and beside a number of churches, newspaper offices, and the state and county buildings, contains a state lunatic asylum, institutions for the deaf and dumb and the blind, and a state prison. The last is a large and handsome edifice. The state house is an elegant building erected at a cost of \$600,000. The Pearl river is navigable to Jackson, and about 30,000 or 40,000 bales of cotton are annually shipped here. II. A post village of East Feliciana parish, La., situated on the E. side of Thompson's creek, 20 m. N. from Baton Rouge; pop. in 1854, about 1,000. It is the seat of the state asylum for the insane, founded in 1848, of Centenary college, under the charge of the Methodists, founded in 1845, and having 9 professors, 98 students, and a library of 5,200 volumes, and of several female seminaries. III. A city and the capital of Jackson co., Mich., situated on the W. bank of Grand river, near its source, and at the junction of the Jackson branch of the Michigan southern and northern Indiana railroad with the Michigan central road, 76 m. W. from Detroit; pop. in 1854, 6,510. It is connected with Lansing by a plank road about 40 m. long. The river furnishes valuable water power, and there are several mills and factories in operation. In 1859 the city had a woollen factory, a tannery, a brewery, a foundry and machine shop, a flouring mill, 2 brick yards, 5 manufactories of agricultural implements, 2 of pumps, 2 of soap and candles, and 4 of carriages, 2 planing mills, 2 weekly newspapers, and 10 churches (2 Baptist, 1 Christian, 1 Congregational, 1 Episcopal, 3 Methodist, 1 Roman Catholic, and 1 Swedenborgian). The city is lighted with gas. There is a mine of bituminous coal within the city limits, and another a few miles distant. The Michigan state penitentiary is situated here, and in 1859 had 480 inmates. During the previous year its receipts from the wages of convicts employed at manual labor were \$56,138, and its expenditures \$56,227. It occupies an enclosed area of 8 acres. The main building is 500 feet long, 57 broad, and 44 high.

JACKSON, ANDREW, 7th president of the United States, born in the Waxhaw settlement, N. C., March 15, 1767, died at the "Hermitage," near Nashville, Tenn., June 8, 1845. His parents, who were of the Scotch-Irish race, emigrated from Carrickfergus, Ireland, in 1765, and settled on the banks of Twelve Mile creek, a branch of the Catawba river. They had been very poor at home, the father tilling a few acres, while his wife, Elizabeth Hutchinson, belonged to a hard-working and scantily paid family of linen weavers. Mr. Jackson never owned any land in America, and after his death, early in the spring of 1767, and before the birth of his son Andrew, his widow removed to Waxhaw creek,

where her relatives resided. It was in the house of her brother-in-law, George McKemey, that the future president was born, a few days after the death of his father. Shortly afterward Mrs. Jackson removed to the house of another brother-in-law, Mr. Crawford, whose housekeeper she became, because of the illness of his wife. Little is known of Andrew's childhood. He is described as a frolicsome, mischievous, generous, brave, and resolute boy, passionately fond of athletic sports, in which he was excelled by no one of his years. He was not addicted to books, and his education was limited, though it is said his mother wished to train him for the pulpit. At an early age he took up arms, and was a witness of the defeat of Sumter at Hanging Rock in 1780. He had previously seen the dead and wounded of the Waxhaw militia, after the massacre of that force by Tarleton, and had assisted his mother and his brother Robert in ministering to the wants of the disabled Americans. His brother Hugh died in 1779, at Stono, while serving under Col. Davie. The two brothers were active whigs, and were captured by the enemy in 1781. The British commander ordered Andrew Jackson to clean his boots, and on the boy's refusal struck him on the head and arm with his sword, inflicting two wounds. His brother Robert, who displayed equal spirit, was knocked down and disabled. Imprisoned at Camden, Jackson was an eye-witness of the defeat of Gen. Greene in the action of Hobkirk's hill. While the brothers were suffering from the small pox, in prison, their mother effected their exchange, and took them back to Waxhaw, where Robert died; and it was many months before Andrew's health was restored. His mother then proceeded to Charleston to aid the Americans there imprisoned, where she was attacked by ship fever, of which she soon died. Left an orphan, and utterly destitute, Jackson had to labor hard for a meagre subsistence. He worked for a time in a saddler's shop, kept by one of his relatives; and he taught school, that all but universal resource of the young American ambitious of bettering his condition. Before he had completed his 18th year he resolved to become a lawyer, and commenced his professional studies at Salisbury, N. C., in the office of Mr. Spence McKay, a jurist of distinction. He did not neglect his studies altogether, but paid more attention to horse racing, foot racing, cock fighting, and similar amusements common at that time, than to the law. Finishing his studies in the office of Col. Stokes, he was licensed to practise in the North Carolina courts before he had reached the age of 20 years. He resided for a short time at Martinsville, where he is said to have assisted two of his friends who kept a store. Tradition adds that he held the office of constable. In 1788 he was appointed solicitor, or public prosecutor, of the western district of North Carolina, embracing what is now the state of Tennessee. He arrived at Nashville in the autumn, and entered immediately upon an

active career. His practice was large. He had to travel much, making 22 journeys in 7 years between Nashville and Jonesborough, the latter place being the principal town in East Tennessee, and 280 miles distant from Nashville. All these journeys, and others, were made at the risk of his life, owing to the numbers and hostility of the Indians; and on several occasions he was in great danger.—In the summer of 1791 he married Mrs. Rachel Robards. This lady was a daughter of Col. John Donelson of Virginia, one of the founders of Tennessee, and her first husband was Mr. Lewis Robards of Kentucky. Mr. and Mrs. Robards were boarding with Mrs. Donelson, then a widow, when Jackson arrived at Nashville, and took up his residence in the same family. In 1790-'91 Mr. Robards applied to the legislature of Virginia for an act preliminary to a divorce, stating that his wife was living in adultery with Andrew Jackson. His request was complied with, and under the act passed, a jury was summoned late in 1793, and the court of Mercer co., Ky., declared the marriage between Lewis Robards and Rachel Robards dissolved. Both Jackson and Mrs. Robards believed that the act passed by the Virginia legislature was itself a divorce, and they were married at Natchez, 2 years before the action of the Mercer co. court. Judge Overton, an intimate friend of the Jacksons, in his account of their friendship and marriage, says: "About the month of December, 1793, after Gen. Jackson and myself had started to Jonesborough, where we practised law, I learned for the first time that Capt. Robards had applied to Mercer court, in Kentucky, for a divorce, which had then recently been granted, and that the legislature had not absolutely granted a divorce, but left it for the court to do. I need not express my surprise on learning that the act of the Virginia legislature had not divorced Capt. Robards. I informed Gen. Jackson of it, who was equally surprised; and during our conversation, I suggested the propriety of his procuring a license on his return home, and having his marriage ceremony again performed, so as to prevent all future cavilling on the subject. To this suggestion he replied, that he had long since been married, on the belief that a divorce had been obtained, which was the understanding of every person in the country; nor was it without difficulty he could be induced to believe otherwise. On our return home from Jonesborough, in Jan. 1794, to Nashville, a license was obtained, and the marriage ceremony performed. The slowness and inaccuracy with which information was received in W. Tennessee at that time will not be surprising, when we consider its insulated and dangerous situation, surrounded on every side by the wilderness and by hostile Indians, and that there was no mail establishment till about 1797, as well as I recollect." The circumstances of this marriage led in after days to very serious misrepresentations, when Gen. Jackson had become the chief of a great party, and caused the

husband much sorrow, more on his wife's account than on his own. Mr. Robards was a man prone to jealousy without cause, and Jackson was not the first man of whom he was jealous. His statement to the legislature of Virginia, accusing his wife of criminal conduct, is believed to have been wholly unfounded. His relatives all sided with his wife, and never supposed her to be guilty of even an act of simple impropriety. In all his relations with women Jackson's conduct was singularly pure, and his character for chastity is as well established as his character for bravery. Col. Benton, who knew the parties intimately, through a long course of years, observes: "There was an innate, unvarying, self-acting delicacy in his intercourse with the female sex, including all womankind; and on that point my personal observation (and my opportunities for observation were both large and various) enables me to join in the declaration of the belief expressed by his earliest friend and most intimate associate, the late Judge Overton of Tennessee. The Roman general won an immortality of honor by one act of continence; what praise is due to Jackson, whose whole life was continence? I repeat, if he had been born in the time of Cromwell, he would have been a Puritan. Nothing could exceed his kindness and affection to Mrs. Jackson, always increasing in proportion as his elevation and culminating fortunes drew cruel attacks upon her. I knew her well, and that a more exemplary woman in all the relations of life—wife, friend, neighbor, relative, mistress of slaves—never lived, and never presented a more quiet, cheerful, and admirable management of her household. She had not education, but she had a heart, and a good one; and that was always leading her to do kind things in the kindest manner. She had the general's own warm heart, frank manners, and hospitable temper; and no two persons could have been better suited to each other, lived more happily together, or made a house more attractive to visitors."—Mr. Jackson became district attorney of Tennessee when that country was made a federal territory; and when the territory became a state, in 1796, he was a man of some wealth, owning much land. He was chosen one of the 5 members from Davidson co. of the convention which met at Knoxville, Jan. 11, 1796, to make a constitution for the new state, and he was appointed on the committee which drafted that instrument. In the autumn of 1796 he was elected to represent the state in the popular branch of congress, Tennessee being entitled to but one member. He entered the house on the first day of the last session of the 4th congress, Dec. 5, 1796, when Washington was on the eve of his retirement. "Congress," says Mr. Gibbs, in his "Memoirs of the Administration of Washington and John Adams," "formed a quorum on the first day of the session. On this day a delegate from the newly added state of Tennessee appeared, was qualified, and took his seat; one whom, young and

unknown as he then was, destiny had marked out as the future ruler of the nation, into whose grand council he now came as the first representative of its youngest member; and how many on that floor foresaw, in his gaunt frame and iron visage, a successor of him who was now to bid them farewell, the man who for good or for evil was to wield the future destinies of his country with the power of a Cæsar." Jackson belonged to the republican (afterward democratic) party, then in course of formation under the lead of Thomas Jefferson, who had just been elected vice-president of the United States. He was one of the 12 representatives who voted against the adoption of an address to President Washington, in reply to his last annual address to congress, as he could not conscientiously approve of all the acts of the administration; and this independent conduct was often brought up against him when he became a candidate for the presidency. His first speech was made on Dec. 29, in support of claims for services against the Indians. He pushed the question with his usual earnestness, speaking more than once, and succeeding in his purpose. His votes during the session show his character. He voted to lay taxes on slaves, to complete 3 frigates, against buying peace of the Algerines, against a large appropriation to aid in furnishing the president's house, and against the removal of the restriction confining the expenditure of public money to the specific objects for which each sum was appropriated. His course was highly approved by his constituents; and he was made a member of the U. S. senate, in which body he took his seat, Nov. 22, 1797. There is nothing known of his senatorial career. So far as appears, he never then made a remark or cast a vote as a senator. In April, 1798, he returned to Tennessee, on leave, and immediately resigned his seat. He was elected a justice of the supreme court of Tennessee, by the legislature, at a salary of \$600 a year, and held courts in various parts of the state. None of his decisions remain. While he was on the bench he was involved in a quarrel with Gov. Sevier, which dated further back, but came to a crisis in 1801, when Jackson was elected a major-general of militia over Sevier. Jackson suspected Sevier of having been engaged in certain land frauds. They had a violent wordy quarrel at Knoxville in 1804, and agreed to fight; but as they could not settle the terms, Jackson posted Sevier as a coward. They afterward met informally, and were about to fight, when friends interfered and prevented a combat. Jackson's hot temper involved him in frequent quarrels, but it is not the less true that many of them were owing to warmth of heart. His impatience of injustice sometimes led him into controversies, especially in behalf of those who were unable to defend themselves. When Louisiana was purchased from France, he expected the governorship of that territory, but was disappointed. In 1798 he had sold lands to a Philadelphian, and on the basis of the notes he

received bought goods suitable for the Tennessee market; but the failure of the Philadelphian threw him into difficulties, and in order to clear them off he resigned his judgeship, July 24, 1804. He sold a large amount of property, and so relieved himself from debt, of which he was ever most impatient. He removed to the place that subsequently became known as the "Hermitage," with his slaves, and dwelt in a log house. He extended his business, being chief of the trading firm of Jackson, Coffee, and Hutchings; and he raised cotton, corn, wheat, horses, cows, and mules. He had a cotton gin, then a rarity. The firm traded to New Orleans, and built boats for other traders; but it lost much money, and came to an end. Jackson was an exact and judicious business man, and succeeded in all undertakings managed by himself. The failure in his commercial operations grew out of the proceedings of the firm during his absence.—It was in the opening days of 1806 that was commenced that quarrel which led to the duel between Gen. Jackson and Charles Dickinson, and to the latter's death. Mr. Dickinson had previously used disparaging words of Mrs. Jackson, which he had explained away; but he repeated them, whereupon Gen. Jackson remonstrated with his father-in-law, Mr. Ervin, saying: "I wish no quarrel with him; he is used by my enemies in Nashville, who are urging him on to pick a quarrel with me. Advise him to stop in time." Becoming involved in a quarrel with a Mr. Swann, relative to the terms of a horse race, Gen. Jackson found the name of Mr. Dickinson offensively introduced into the letters written by Swann, which drew from him certain characteristic comments, and these were carried to their subject, as it was the intention of their writer they should be. Mr. Dickinson, on Jan. 10, just before starting for New Orleans in a flat-boat, wrote an insulting letter to Gen. Jackson, charging him with equivocations, falsehood, and cowardice. Gen. Jackson heard, and believed, that on his way down the river Mr. Dickinson passed his leisure in pistol practice, expecting a challenge on his return home. During his absence the wordy controversy between Jackson and Swann was continued, and led to a tavern fight, commenced by the former. A Mr. McNairy was drawn into the quarrel on one side, and was met by Jackson's friend John Coffee on the other; and, pending the return of Mr. Dickinson, these gentlemen had a duel, in which Coffee was shot, his antagonist, it was asserted, firing too early. Mr. Dickinson returned to Nashville on May 20, and on the 21st he published a severe attack on Gen. Jackson, provoked in part by the language of his antagonist in the course of the Swann quarrel. On the instant Jackson challenged him, and a duel was arranged for May 30, though the challenger was desirous of an immediate combat. The parties met on the banks of the Red river, in Logan co., Ky., early on the appointed morning. The place is a long day's journey from Nashville, and the duellists had

to leave their homes early on the 29th, Dickinson being accompanied by a number of his associates, as he was very popular, and stood high in the society of Nashville. His second was Dr. Catlet, and Jackson's was Gen. Overton. The distance was 8 paces, and Overton won the right to give the word. Dickinson aimed at where he supposed Jackson's heart was, and fired at the word, breaking a rib, and raking the breast bone; but so great was Jackson's resolution, that he gave no sign of being hit, and his antagonist, who had made sure of killing him, exclaimed: "Good God! have I missed him?" Jackson then aimed, and Dickinson fell mortally wounded. He died that night, not even knowing that his ball had hit Jackson. It was a point of pride with Jackson not to let him know that his aim had been effectual. His reason for concealing his wound, as he once stated to a friend, was, "that as Dickinson considered himself the best shot in the world, and was certain of killing him at the first fire, he did not want him to have the gratification even of knowing that he had touched him." But, according to Jackson's last biographer, Mr. Parton, his "wound proved to be more severe and troublesome than was at first anticipated. It was nearly a month before he could move about without inconvenience, and when the wound healed, it healed falsely; that is, some of the viscera were slightly displaced, and so remained." This duel made Jackson unpopular in Tennessee, until his military exploits had withdrawn public attention from its circumstances; and when he was a candidate for the presidency it was brought forward in the journals opposed to his election, and the circumstances were much distorted.—In 1805, when Aaron Burr made his first visit to the West, he became the guest of Gen. Jackson on two occasions. The western people were anxious for a war with Spain, and Burr was popular with them, because he was believed to represent and support their opinions. Jackson was of the war party. After Burr's return to the East he and Jackson corresponded, the latter even making out the lists of officers for two regiments which the former suggested might be raised in Tennessee, in the event of war. Burr arrived at the Hermitage in Sept. 1806, and was warmly received; and it was at the instance of his host that a public ball was given in his honor at Nashville, though rumors adverse to him and his doings were then current. Jackson, in full military costume, led Burr into the room, and introduced him to the persons there assembled. Burr soon departed, and in November he sent an order to Jackson for boats and provisions, which, with the money accompanying it, Jackson handed to his partner, John Coffee, who proceeded to fulfil the directions. A week later (Nov. 10) Jackson received intelligence that led him to doubt Burr's integrity. He then directed that no further engagements should be made with Burr, and wrote to him, demanding to know the truth. He also wrote

a warning letter to Gov. Claiborne of Orleans territory, and another to President Jefferson, tendering the services of his militia division to the general government. Burr arrived at Nashville, Dec. 14, and sought Jackson, whom he assured of the falsity of the charges against him. They had a pecuniary settlement, and Burr departed, taking but 2 of the 8 boats for which he had contracted. Shortly after his departure, the proclamation of the president denouncing him arrived, and he was burned in effigy in the very town where he had been the object of high honors but a few weeks before. On Jan. 1, 1807, Gen. Jackson received orders from the government at Washington to hold his command in readiness to act. The revolutionary veterans in Nashville tendered their services to Jackson, who accepted their offer. He exerted himself with his usual energy; but his active loyalty did not save him from the suspicion that he was leagued with Burr, which was long obstinately cherished, and was frequently alluded to in the presidential contest of 1828, and later. He was summoned to Richmond as a witness in the trial of Burr, and there he acted as one of Burr's most zealous partisans. "There he harangued the crowd in the capitol square," says Mr. Parton, "defending Burr, and angrily denouncing Jefferson as a persecutor. There are those living (1859) who heard him do this. He made himself so conspicuous as Burr's champion at Richmond, that Mr. Madison, the secretary of state, took deep offence at it, and remembered it to Jackson's disadvantage 5 years later, when he was president of the United States, with a war on his hands. For the same reason, I presume, it was that Jackson was not called upon to give testimony upon the trial." Jackson at this time belonged politically to that portion of the democratic party which sought to have Mr. Monroe nominated as President Jefferson's successor, the president himself preferring Mr. Madison. For some years he was not a public man, holding no office, living at the Hermitage, and devoting himself to agricultural pursuits. His life was not altogether a quiet one, however, as, beside some lesser disputes, he had an animated quarrel with Mr. Dinsmore, agent of the Choctaw Indians.—When, in 1812, war was declared by the United States against England, Gen. Jackson promptly tendered his services, and those of 2,500 men of his division of Tennessee militia, to the national government, and the offer was as promptly accepted; but it was not until Oct. 21 that government requested Gov. Blount to send 1,500 men to New Orleans. Orders to act were given to Gen. Jackson, who appointed Dec. 10 for the meeting of the troops at Nashville. A force of infantry and cavalry, 2,070 strong, was organized; and on Jan. 7, 1813, the infantry embarked, while the cavalry marched across the country. On Feb. 15 the little army assembled at Natchez, where it remained by direction of Gen. Wilkinson. At the close of March Jackson received an order from the secretary of war

to dismiss his corps. He so far disobeyed the order as to conduct his force back to Tennessee before disbanding it. It was on this march that the soldiers gave him the name of "Hickory," because of his toughness, and in time this was changed into "Old Hickory." He tendered his corps for an invasion of Canada, but no answer came from Washington, and on May 22, at Nashville, the men were dismissed. Government allowed his transportation drafts to be protested, and his private fortune would have been irretrievably ruined had not his friend Col. Benton made "an appeal from the justice to the fears of the administration." When the administration found that the state of Tennessee would be lost to it if this scandalous act of injustice were persisted in, justice was immediately done. The singular affray with the Bentons, which was so often mentioned during the time that Gen. Jackson was at the head of the democratic party, occurred in 1813. One of Jackson's friends, William (afterward General) Carroll, became involved in a quarrel with Mr. Jesse Benton, a brother of Col. T. H. Benton, and challenged him. Carroll asked Jackson to be his second, which he declined, until Carroll told him there was a conspiracy "to run him (Carroll) out of the country," when he resolved to interfere, partly from indignation, but more from the desire to prevent a fight. At first he was successful in his remonstrances with Benton, but the latter finally resolved that the duel should go on. Jackson acted as Carroll's second. Benton sent an offensive account of the affair to his brother, who was then serving Jackson so well at Washington. Others, enemies of Jackson, sent him similar accounts. This led to an angry correspondence between Gen. Jackson and Col. Benton, and the latter made use of the harshest language in speaking of the former, all of which was reported to the general, who threatened that he would horsewhip the colonel the first time they should meet. On Sept. 4, Gen. Jackson, accompanied by Col. Coffee, met the Bentons in the streets of Nashville. Bidding him defend himself, and avowing his purpose, Jackson advanced upon Col. Benton, who sought to draw a pistol, but was anticipated by his antagonist, who drew such a weapon and aimed at him. Benton retreated, and Jackson followed him, until they reached the back door of the city hotel, when Jesse Benton fired at Jackson, shattering his left shoulder, the pistol being charged with two balls and a slug. Jackson fell; and Coffee, who entered on hearing the report, fired at Col. Benton, but missed his aim. He was then about to strike down the colonel, when the latter stumbled down a staircase. Meantime Mr. S. Hays, a nephew of Mrs. Jackson, who knew that it was Jesse Benton that fired at the general, volunteered in his relative's aid, and a fierce conflict ensued between him and Jesse, he making use of a sword cane first, and then of a dirk, and throwing him down. Benton was wounded in several places, and would have been killed had not a bystander

caught Hays's hand. Jackson suffered severely from this combat. It caused irreparable injury to his body, and his political enemies were never tired of repeating its details, distorted by partisan criticism. Nothing but his own resolution prevented the loss of his left arm, as all the doctors but one recommended amputation.—The massacre of Fort Mims by the Creek Indians, which took place Aug. 30, 1813, created an extraordinary excitement throughout the south-west. Gen. Jackson addressed the volunteers, and appointed Fort St. Stephen as the rendezvous for all who would arm themselves and were disposed to take part in a war of Indian extermination. On Sept. 25 the legislature of Tennessee called 3,500 volunteers into the field, beside the 1,500 that were in the national service. Jackson, though too feeble to leave his bed, issued addresses, and aided in the organization of the troops. His division was ordered to rendezvous at Fayetteville, Oct. 4; and Col. Coffee was sent with a cavalry force to Alabama. Still suffering from his wounds, Jackson was at Fayetteville Oct. 7. On the 11th his force moved, and marched 32 miles in 6 hours, in the hope of meeting the Indians. His army suffered greatly from a defective commissariat, and this delayed his operations. On Nov. 3 Col. Coffee defeated the Creeks at the town of Tallushatchee, inflicting heavy loss on them, and destroying the place. On Nov. 9 Gen. Jackson defeated the Creeks at Talladega, where hundreds of them were killed or wounded. The want of food prevented these victories from being very useful. The troops were starving, and starvation caused mutiny. A misunderstanding as to the term of service of the volunteers occurred between them and their commander. With a force of newly raised men, less than 1,000 strong, beside Indians, he entered the enemy's country in Jan. 1814. He defeated the Indians at Emuckfaw and Enotochopco, Jan. 22 and 24, which were among the severest reverses they ever experienced. The details of the battle showed much skill on the side of the victors, Jackson's energy and bravery being very conspicuous. The troops were then dismissed, but a new force was speedily formed, composed in part of regulars. In February Jackson was at the head of 5,000 men. The Creeks, who were encouraged by some of the incidents of the preceding battles, made a final stand at Tohopeka, or the Horseshoe, a peninsula in the Tallapoosa river; and their position was one of much strength, though defended by numbers inadequate to its extent. Jackson arrived before this post, March 27, 1814, with 2,000 troops, and attacked it the same day. It was taken, and of its 900 defenders 750 were killed or drowned, the victors losing 201 men. This victory ended not merely the Creek war, but the power of the Indian race in North America. Wars with the Indians have since been waged, at much cost of blood and money, but there has in no case been any doubt of the event; whereas down to the year 1814 the aborigines contended

with the intrusive race with some hope of success, forming confederacies and leagues against it, and showing both statesmanship and military skill. Jackson's victories, which were the consequences of his energy and soldiership, settled for ever the long quarrel that had been carried on between the white man and the red man, in favor of the former. Weathersford, the principal Creek chief, surrendered to him, and was protected. Some of the Indians fled to Florida, but most of them obeyed Jackson's order to retire to the north, where they were supported by the United States for the time. In the summer of 1814 Gen. Jackson and Col. Hawkins made with them the treaty of Fort Jackson, the terms of which were as moderate as regard for the peace and safety of the white settlers allowed. The chiefs bestowed upon Jackson 3 miles square of land, and President Madison was desirous that he should be allowed to accept the gift, in which view congress could never be brought to concur. The victorious Tennesseans marched for their homes on April 21, and were soon dismissed from the service. They and their commander were the objects of great attention.—Gen. Jackson had now obtained a national reputation, and on May 31 his appointment as a major-general in the U. S. army was officially announced. Thus in the national service, he became the acknowledged military leader of the S. W. quarter of the Union, various circumstances having placed him in a position to which 6 other generals had claims. The English were preparing a grand attack on the south-west, and in July, 1814, Gen. Jackson left his home for Mobile, against which the first blow of the enemy was to be delivered. Florida was then a Spanish province, but the English used it as if it were one of their own possessions; and from Pensacola, the best harbor on the gulf of Mexico, they organized expeditions against the United States, and aided the Indians. It was now the rendezvous of their forces, and the Spaniards had neither the power nor the disposition to prevent this abuse of neutral territory. The head-quarters of the British commander were in the house of the Spanish governor, Manriquez. When Gen. Jackson arrived at Mobile, he found but a small force at his command, yet he resolved to strike at the root of the evil that threatened his country, by the seizure of Pensacola. He wrote to the secretary of war, asking permission to attack that place, but the secretary's reply reached him only at the end of 6 months. He opened a correspondence with Manriquez, which led to no change of conduct on the part of the Spaniards, Col. Nichols, the English commander, continuing his preparations at Pensacola for an attack on Mobile. Assuming the responsibility, as his custom was, both in politics and in war, Gen. Jackson determined to act without orders. He gave direction that the Tennessee levies should march upon Mobile. The call he made upon his old comrades was so well obeyed, that men

paid large sums for the privilege of filling vacancies in the corps that had been mustered into the service. Meantime he threw a small force into Fort Bowyer, on Mobile point, commanded by Major Lawrence. This fort, which was in an incomplete state, was assailed, Sept. 15, by a British fleet, aided by a combined force of Indians and marines. The enemy were repulsed, losing one of their ships and 72 men. A mutiny in the ranks of the Tennessee troops delayed the arrival of the force under Gen. Coffee, and it was not until Oct. 26 that Jackson found himself at their head, his entire force consisting of 4,000 men, 1,000 of whom were regulars, and 1,500 mounted volunteers. He hung 6 of the mutineers, and his conduct was the subject of much hostile discussion at a later period. He marched immediately upon Pensacola, at the head of 3,000 men. Negotiations failing, he seized the town by force, Nov. 6; and the British blew up the fort that commanded the mouth of the harbor, their 7 vessels leaving the bay. On Nov. 11 Jackson was again at Mobile, where he remained until the 22d, to meet an expected attack, and whence he sent a force that expelled Nichols and his Indians from Florida. He sent the mass of his troops to New Orleans, and reached that place himself Dec. 2, 1814. The city was in a miserable condition as to means of defence; and had the English moved with ordinary rapidity, it must have fallen into their hands before Jackson could have done any thing for its salvation. He immediately adopted the most energetic measures, and prepared to meet the enemy, displaying a genius for warfare against the trained troops of Europe equal to that which he had exhibited in the contests of the wilderness. He inspired the citizens of Louisiana, and some of the local authorities, with a zeal second only to that by which he was himself animated. On Dec. 14 a powerful British naval force captured a small American fleet, 5 gun boats and a schooner, which gave the enemy command of the route to New Orleans, had they known how to use it. The next day Jackson declared martial law, having already called out the whole of the state militia. The forces under his orders consisted of Tennessee, Kentucky, Louisiana, and Mississippi militia, a few regulars, Baratarian privateersmen, and a battalion of colored men. The vanguard of the British army, under Gen. Keane, was landed on Dec. 16, and marched to a spot within 9 miles of New Orleans on the morning of the 23d. Jackson learned their arrival before 2 P. M., and prepared to attack them in their camp. He assembled a motley force, 2,131 strong, of whom only about 1,800 were engaged, and, aided by Lieut. Henley, in the U. S. schooner *Carolina*, assailed the British. A very hot action was fought, with decided advantage to the Americans, as the effect of it was to prevent the enemy's advance upon the city; and the victory might have been made complete had not large British reinforcements arrived during the night. New Orleans was really saved

on the night of Dec. 23, as the enemy were made over cautious by the occurrences of the battle then fought. Jackson fell back to a canal, 4 miles from the city, where his famous line was constructed; and he provided against attacks from other directions. Sir E. Pakenham arrived on the 25th, and made new arrangements in the British army. The *Carolina* was destroyed by his batteries that evening. He attacked Jackson on the 28th, and was repulsed. On Jan. 1, 1815, another attack was made, principally with artillery, and again the enemy were signally beaten. These results were owing to the skilful manner in which Gen. Jackson managed the resources at his command, and to the enthusiasm with which he had inspired his brave but mostly inexperienced troops. He caused the invaders to be constantly harassed by night attacks, so that they were unable to obtain any rest. He was reinforced by the arrival of 2,250 Kentucky militia, Jan. 1, but they were mostly unarmed, the arms that had been ordered from Pittsburg to New Orleans having failed to reach that place because the contractors would not pay the cost of transporting them more rapidly. The English were reinforced on Jan. 6; and their entire army, including seamen and marines, probably consisted of 14,000 effective men, well supplied with the means of war; but their authorities place it as low as 8,000. The English have greatly exaggerated Jackson's numbers, placing them as high as 25,000, when, if he had that number of men, he had not the means of arming them. His line on the left bank of the Mississippi was about a mile long, with 12 guns, and was defended by only 3,200 men, while 800 more were distributed in positions hard by. It was a strong position; the cannon were well served by Lieut. (subsequently Gen.) Armstrong, and by the Baratarians; and so extremely slippery was the soil, that according to Major Latour, an eye-witness, a man unincumbered and unopposed would have found it difficult to mount the breastwork, at leisure and carefully. Its weakness was in the fact that it was commanded from the right bank of the Mississippi, where were American batteries, manned by seamen, and supported by Kentucky militia. The English enlarged the Villere canal, and prepared to throw a force upon the right bank of the river, their plan being to storm the American position on that bank before commencing their attack on Jackson's line, which, indeed, must have been made untenable if their plan had been successful. Col. Thornton was despatched, at the head of 2 regiments and 600 marines and seamen, across the river, on the night of the 7th; but delays were experienced in his operations, and it was not until the event of the campaign had been decided on the left bank, that he was enabled to advance against the Louisianians and Kentuckians, who gave way, and so forced the seamen to abandon their batteries. Meantime, on the left bank the British columns were directed against the American line; but they were received with

so severe a fire, that they were beaten back, Gen. Pakenham being killed, Gen. Gibbs mortally wounded, and Gen. Keane severely wounded. The attack was repeated, but with no success. The weight and precision of the American fire were such that no troops in the world could have stood against it. One British authority says that not even from St. Sebastian had so severe a fire been poured upon an attacking force. A small British force succeeded in carrying a battery near the river, after losing three fourths of its number, but abandoned it. One British regiment, the 93d highlanders, distinguished for its services in many parts of the world, lost more than half its men, having been brought to a point where it could do no good, but where it could be most effectually operated upon by the Americans. The British troops never behaved better, but they were badly handled; and it is the evidence of one of their own officers that Sir E. Pakenham's impatience in giving the signal of attack too soon, instead of waiting for the development of Thornton's movement, was the cause of the severe loss that befell his army. The British had been accustomed to carry every position they assailed in Spain and France, and when they adopted the same mode of attack against a line defended by men accustomed to fire accurately, the power of the infantry weapon told with fatal effect upon their dense columns. The merit of Gen. Jackson consisted mainly in the fact that he adapted his means of defence most shrewdly to the character of his own forces no less than to that of the brave enemy whom he met and defeated. He understood both the friends around him and the foes before him, and victory, and the safety of his country, were the results of his rare foresight and wise conduct. His opponents have never hesitated to admit his merits in the strongest language. "Gen. Jackson," says "Blackwood's Magazine," "behaved with humanity and generosity to all his prisoners, which did him as great honor as his conduct in the defence. We do not hesitate to call him a great man. Unappalled by the landing of a formidable army of British veterans, he infused fresh courage into the hearts of his countrymen, naturally brave; the danger was great, but the Americans under him had no fear, even of such a foe; strong as their position was, 'a mile-long line full of men,' it was found impregnable, not because of cotton bags only and parapets, but because of patriots deadly with steady hands, keen eyes, and stern hearts—invincible where they stood—unerring marksmen, whatever were their numbers—with a commander endowed with a genius for war, and in all respects equal to the glorious duty he had taken upon himself in his country's cause." The number of the British engaged on the left bank is variously stated, the lowest figures on the British side being 5,195, which seem too low. On the right bank of the Mississippi, Col. Thornton's attack was entirely successful, his men driving before them the Americans. This

was owing to an order given by one of Gen. Morgan's aids, who directed a retreat that was rapidly converted into a flight. The seamen, under Capt. Patterson and Lieut. Henley, who served a heavy battery on the right bank, though compelled to abandon it, did so with great coolness, spiking their guns, and throwing their ammunition into the river. Their success on that side gave the British virtual command of the left bank, and of New Orleans; but they had been so roughly handled before Jackson's line, that they had no heart to pursue and complete the really signal advantage they had gained over his lieutenant. Gen. Lambert, who had succeeded to the command of the British army on the fall of his superiors, sent a flag to Gen. Jackson, proposing an armistice. Jackson consented, on condition that while hostilities should be suspended on the left bank, they should not be so on the right bank, and that neither party should send reinforcements there. Gen. Lambert ordered Col. Thornton to return to the left bank, and the British gave up their solitary advantage. The enemy's loss on the left bank was about 2,000 men, in killed, wounded, and prisoners; the American loss, 7 killed and 6 wounded. On the right bank neither party suffered much, but even there the loss was mostly on the side of the enemy. Gen. Jackson's brilliant successes did not cause any cessation of care and vigilance on his side, and he watched the enemy until the 18th, when they retreated, abandoning guns, and leaving 80 wounded men to the care of the Americans. Gen. Jackson was involved in much trouble by the conduct of many civilians during the campaign, who forgot that a dictatorship alone could save the state, which the enemy, had they been victorious, would probably have retained, in spite of the treaty of Ghent, on the ground that the treaty of 1803, by which France had ceded Louisiana to us, was void and of no effect, because she had no claim to the territory she had sold. A Frenchman, M. Louiallier, a member of the legislature of Louisiana, was conspicuous among the general's enemies, and him the general had arrested on March 5. Judge Hall, of the U. S. district court, granted Louiallier's petition for a writ of habeas corpus, and was himself arrested and imprisoned, and then banished from the city. On March 13 martial law was abrogated by Jackson's order, and Hall returned. Gen. Jackson was then arrested, on a charge of contempt of court, and fined \$1,000. He refused the offers that were made from all sides to pay the fine, and paid it himself, protecting the court, which could not have stood a moment against his opposition. After his retirement from public life, some of his friends requested congress to refund the amount of the fine. This petition was successful, after encountering considerable opposition; and the bill refunding the money, principal and interest, was passed in Feb. 1844.—The brilliant successes of the Louisiana campaign made Gen. Jackson very popular throughout the whole country, and government

was not behind the people in acknowledging his merits. He was made commander-in-chief of the southern division of the United States in April, 1815. He received the thanks of congress for his services. Even at that early day he was thought of as a candidate for the presidency, and his political prospects were not injured when it was known that he gave advice to the government to pursue a liberal course toward the federalists, whose political importance had vanished. He was offered the office of secretary of war by President Monroe. Toward the close of 1817 a war with the Seminoles was commenced, and Gen. Jackson was ordered to take the field in person. He formed a large force, consisting of regular troops, militia from Tennessee and Georgia, and Creek Indians. He was successful, and without much fighting. He seized the Spanish fort of St. Mark's, where he found a Scotchman named Arbuthnot; and at the Indian town of Suwanee he captured one Ambrister, a native of the Bahamas. These British subjects were tried before courts martial, and condemned on the charges of having stirred up the Indians to war against the United States, and of supplying them with the means of war; and they were executed, though the court that tried Ambrister softened its sentence to whipping and imprisonment, but Gen. Jackson hung him nevertheless. Two Indian chiefs, one of them the prophet Francis, who had been seized, were promptly hanged by his orders. He had a harsh correspondence with Gov. Rabun of Georgia, because under his orders, as Jackson supposed, an attack was made on an Indian village. He then marched upon Pensacola, and, in spite of the remonstrances of the Spaniards, seized that place. These strong proceedings created great sensation, both in the United States and in England. The execution of Arbuthnot and Ambrister was the cause of much irritation in England, and Lord Castlereagh, then secretary of state for foreign affairs, told Mr. Rush, the American minister there, that he could have had war with the United States merely by holding up his hand. Fortunately, the influence of the British ministry was exerted in behalf of peace. The administration of President Monroe was divided on the subject. Mr. J. Q. Adams, secretary of state, ably defended the course of Gen. Jackson, in his correspondence with the Spanish minister, who had demanded an apology and an indemnity for the seizure of the two places in Florida. He also espoused the general's cause in the cabinet, against Mr. Calhoun, secretary of war, who was in favor of putting him on his trial; which last fact was unknown to Gen. Jackson; who believed that Mr. Calhoun had acted with Mr. Adams, and that Mr. Crawford, secretary of the treasury, was his enemy. Always sensitive on this subject, Gen. Jackson's discovery of the truth in after days was attended by consequences that have ever since influenced American politics. In congress, his conduct was the subject of vehement debates, but resolutions of

censure and condemnation were rejected by the house of representatives, and the senate did not come to any decision on the question. The report made to the senate, by Mr. Lacock of Pennsylvania, was very full and very severe, but it was never made the subject of action. So offensive was it to Gen. Jackson, that, it is said, he threatened to cut off the ears of certain senators. His anger was caused by his belief that he had acted in strict conformity to the wishes of the administration; and it is by no means certain that he did not. In 1819 he made a visit to the North, proceeding as far as New York, and was everywhere well received. The government of New York city employed Vanderlyn to paint his portrait. When Spain ceded Florida to the United States, Gen. Jackson was appointed governor of that territory, March 10, 1821, and took possession of it July 18. He held the office only a few months, but during that time he had a dispute with Col. Callava, late Spanish governor of Florida, relative to certain judicial papers that should have been handed over to the new government, but which Callava was endeavoring to carry out of the country. Callava was imprisoned, but released on the seizure of the disputed papers. Judge Fremont-in granted him a *habeas corpus*, which Gov. Jackson not only disregarded, but summoned the judge before him. The judge did not obey the summons, and the governor's course was condemned by some members of congress, in debate; but they failed to obtain a formal censure from that body, a censure which was meant to include the administration, on the ground that Gen. Jackson had exercised larger powers under its authority than were consistent with law and the constitution. President Monroe offered the post of minister to Mexico to Gen. Jackson, which he would not accept.—In 1823 the Tennessee legislature elected him a U. S. senator, and nominated him for the presidency. "At first," says Mr. Tucker, "this nomination afforded matter of jest and merriment rather than of serious animadversion in other states, since, unquestionable as were Gen. Jackson's military qualifications, he was not thought to possess the information, or respect for the civil authority, or temper, deemed requisite in the office of president; and very few believed that the favor which his military successes had produced for him in his own state would find much support in other parts of the Union." The event showed the fallacy of these expectations; for at the election of 1824 Gen. Jackson received 99 electoral votes, Mr. J. Q. Adams 84, Mr. Crawford 41, and Mr. Clay 37. There being no choice made by the electoral colleges, the election devolved upon the house of representatives. From this election Mr. Clay was excluded by the terms of the constitution, and Mr. Adams received the votes of 13 states, and was chosen. Gen. Jackson received the votes of the states of Alabama, Indiana, Mississippi, New Jersey, Pennsylvania, South Carolina, and Tennessee—7; the other 4 states voted for Mr. Craw-

ford. Gen. Jackson then retired from public life; but the entire opposition to Mr. Adams's administration supported him for the presidency in 1828, and he was elected, receiving 178 electoral votes, and Mr. Adams but 83. The contest which had this result was one of the most bitter ever waged in the United States, and Gen. Jackson's character and conduct throughout a long and conspicuous public life were severely assailed, while his private life was not spared. The circumstances of his marriage were grossly misrepresented, and it is said with such effect on Mrs. Jackson, that she died only a few days after it was known that her husband had been chosen president. Assuming the presidential office, March 4, 1829, he commenced a course of vigorous government, which he maintained for 8 years. Mr. Calhoun, who had been vice-president under Mr. Adams, and reelected when Gen. Jackson was chosen president, headed an influential section of the democratic party, and expected to succeed his chief, who had avowed his intention not to be a candidate for reelection. Between him and the secretary of state, Mr. Van Buren, a rivalry ensued. The president was personally alienated from Mr. Calhoun, on being informed that that statesman had been his enemy in the Monroe cabinet at the time of the Seminole war; and became politically hostile in consequence of Mr. Calhoun's assertion of the doctrine of nullification. The democratic party, outside of South Carolina, supported the president; and in 1831 a new cabinet was appointed. Mr. Ingham, secretary of the treasury, and a friend of Mr. Calhoun, made way for Mr. McLane; Mr. Branch, another friend of Mr. Calhoun, left the navy department, which was taken by Mr. Woodbury; and Mr. Berrien, attorney-general, was succeeded by Mr. Taney. Mr. Van Buren gave up the state department to Mr. Livingston, and was appointed minister to England; and Mr. Eaton retired from the war department, which was taken by Gen. Cass. Scandal attributed these changes, and the rupture that had preceded them, to the influence of Mrs. Eaton, wife of the secretary of war, with whom the wives of the Calhoun leaders, as well as many other ladies, refused to associate. Her husband was an old and intimate friend of the president, who zealously espoused Mrs. Eaton's side of the quarrel. When the question of Mr. Van Buren's confirmation came before the senate, in 1832, it was decided in the negative, by the casting vote of Mr. Calhoun. Soon after the formation of his administration, President Jackson exhibited a feeling of hostility to the bank of the United States; and when congress, in 1832, granted a recharter to that institution, he vetoed the bill, July 10. His course relative to appointments gave much offence, as numerous removals were made on political grounds alone, and the vacancies were filled by the selection of ardent partisans; and this proceeding was the more censured, because the president had advised Mr. Monroe to disregard party in making appointments to office. The followers

of Mr. Calhoun had now become "nullifiers," and threatened the country with open resistance to the government. They demanded the reduction of duties to the extent of the disavowal of the protective principle, threatening that South Carolina would nullify the revenue laws if they should not be repealed. A state convention of South Carolina was held at Columbia in 1832, and took measures for resisting the tariff laws then existing. The president himself was opposed to a high tariff, and was ready to continue his constitutional exertions in behalf of such modifications of existing laws as would have left no reasonable ground for complaint on the part of South Carolina; but while the tariff laws endured, he was determined that they should be as rigidly enforced in Charleston as in Boston; and he early let it be understood that he should show no quarter to active disunionists.—The presidential election of 1832 came on while the troubles concerning the U. S. bank, nullification, and the subject of removals from office were at their height. President Jackson had been induced to reconsider his intention not to be a candidate for reelection, and was formally nominated, Mr. Van Buren being the democratic candidate for vice-president. His chief opponent was Mr. Clay, who represented the interests of the friends of the national bank and of protection, and was a powerful and consistent advocate of those grand schemes of internal improvement which President Jackson had checked by his veto of the Maysville road bill in 1831. Mr. Wirt was nominated for the presidency by the anti-masonic party. Much was said by the opposition concerning the president's frequent use of the veto power, and he was charged with being a despot in theory and in practice for setting up his own will in disregard of the opinions of the representatives of the people. The contest was less personal in its nature than that of 1828, but it was one of much vigor, and the opposition entertained confident hopes of success, as they could not believe that interests so strong as those which the president had offended were to be beaten by a party that had lost some of its ablest members, and which was defied by one of the states that had supported Gen. Jackson in 1824 and in 1828. They were mistaken, because they never had been able to understand that the people had a strong and irremovable faith in the president's integrity. When the election was over, it was found that he had been supported by every state in the Union but 7, Mr. Clay receiving the votes of 6 states, and Mr. Wirt those of Vermont only. The nullification crisis occurred in the interval between the decision of the contest of 1832 and the president's second inauguration. The president issued his proclamation against the nullifiers on Dec. 10, 1832; and the "force bill," to enable him to maintain the supremacy of the laws, was passed through both branches of congress. Fortunately, a compromise was effected, under the lead and influence of Mr. Clay, by which the tariff was essentially modified, and

an excuse for not proceeding to extremities was afforded to South Carolina. The second of President Jackson's terms of service was even a more exciting period than his first term had been. The "bank war" was renewed with vigor. He recommended in his annual message of 1832 that the stock in the bank owned by the government should be sold; and though the house of representatives had declared in favor of continuing the deposits of the public money in the bank, the president resolved upon their removal. This was effected on Sept. 22, 1833, when an order was issued by Mr. Taney, secretary of the treasury, directing the collectors to cease making their deposits in the bank, as no removal of money actually on deposit was contemplated by the president. The measure was the president's own. He called a cabinet council on Sept. 10, at which he read a paper in support of it, but found few of his advisers ready to agree with him. Mr. McLane having been appointed to the state department, Mr. Duane was placed at the head of the treasury, for the purpose of executing the intention of the president; but as he refused to act, he was summarily dismissed, and Mr. Taney, who succeeded him, carried out the measure, whereupon the senate refused to confirm his appointment. The senate also rejected 4 of the persons appointed government directors, and insisted upon its rejection when they were a second time nominated. That body made a call upon the president for a copy of the paper read to the cabinet on Sept. 10, 1833; but he refused to furnish it, and the senate, by not insisting upon the call, admitted the soundness of his arguments. A formidable combination against the president was effected in the senate, headed by Mr. Calhoun, Mr. Clay, and Mr. Webster, and a resolution condemning his course was adopted, by a vote of 26 to 20. The president sent in a protest, which the senate voted a breach of its privileges. The house of representatives, on the other hand, sustained the president. A panic existed for some time, and the opposition was supported by a powerful popular party. The gold currency was revived, and gradually confidence was restored; and in 1837, just before the expiration of his public life, the sentence passed upon President Jackson was expunged by the senate, the vote standing 24 to 19. This was regarded as the end of the "bank war," by the friends of the president, who compared his civil triumph with that which he had won at New Orleans. Mr. Taney, who had been rejected as secretary of the treasury, was now elevated to the post of chief justice of the United States, made vacant by the death of Judge Marshall. The foreign diplomacy of President Jackson was very successful. Useful commercial treaties were made with several countries, and were renewed with others. Indemnities for spoliations on American commerce were obtained from France, Spain, Naples, and Portugal. With France amicable feelings were for a brief period interrupted, in

consequence of the president's strong language, but they were soon restored, and it was a pleasing circumstance that the good offices of England were interposed to prevent a rupture between the two countries. Many persons had feared that Gen. Jackson would be foud of war as president, and that England would be the object of his enmity; but, as Mr. Ingersoll observes, "no administration of the American government ever was on terms of more cordial amity with Great Britain than that of the president who as commander at New Orleans defied her arms." During his second term the national debt was extinguished, the Cherokees were removed from Georgia and the Creeks from Florida, the original number of the states was doubled by the admission of Arkansas and Michigan into the Union, and the gold currency was greatly increased. On the other side, the agitation of the slavery question was then renewed with more vigor than ever before, and the Seminole war was recommenced.—He had the satisfaction of seeing his friend and associate, Mr. Van Buren, chosen president in 1836, the opposition being unable to unite in the support of any one man. He issued a farewell address to his countrymen, full of good sense and patriotic opinions; and on March 4, 1837, he retired from public life for ever. Leaving Washington on the 6th, he returned to the Hermitage, where he resided until his death, but ever taking a lively interest in politics, and especially in the welfare of the party of which he had been so successful a leader. The immediate occasion of his death was dropsy, but throughout most of his life he had suffered severely from various diseases; and some of those actions of his which have been most warmly condemned were largely owing to the irritation of illness. He was a thoroughly honest man, as straightforward in action as his thoughts were unsophisticated. If his hot temper led him into more than one affair that injured his reputation, the instances of his humanity and benevolence, proceeding from warmth of heart, are far more numerous. His charities were frequent and unostentatious; and in his last days he made an open profession of those religious sentiments which he had always entertained. His chief intellectual gifts were energy and intuitive judgment. The statesman of past times whom he most resembled was Ximenes; and the words of Prescott respecting the great Spaniard are strictly applicable to Jackson: "His enterprises were of the boldest character; his execution of them equally bold. He disdained to woo fortune by any of those soft and pliant arts, which are often the most effectual. He pursued his ends by the most direct means. In this way he frequently multiplied difficulties; but difficulties seemed to have a charm for him, by the opportunity they afforded of displaying the energies of his soul." Jackson's energy enabled him to win victories over powerful foes, in politics and in war; and to the last he remained popular, the result of his integrity, his courage, and his scorn of all

the arts of political life. In private life at the Hermitage he is described by Col. Benton as a careful farmer, overlooking every thing himself, seeing that the fields and fences were in good order, the stock well attended, and the slaves comfortably provided for. "His house was the seat of hospitality, the resort of friends and acquaintances, and of all strangers visiting the state, and the more agreeable to all from the perfect conformity of Mrs. Jackson's character to his own. But he needed some excitement beyond that which a farming life can afford, and found it for some years in the animating sports of the turf. He loved fine horses, racers of speed and bottom, owned several, and contested the four-mile heats with the best that could be bred or brought to the state, and for large sums. That is the nearest to gaming that I ever knew him to come. . . . His temper was placable as well as irascible, and his reconciliations were cordial and sincere. Of that my own case was a signal instance. After a deadly feud I became his confidential adviser; was offered the highest marks of his favor, and received from his dying bed a message of friendship, dictated when life was departing, and he would have to pause for breath. There was a deep-seated vein of piety in him, unaffectedly showing itself in his reverence for divine worship, respect for the ministers of the gospel, their hospitable reception in his house, and constant encouragement of all the pious tendencies of Mrs. Jackson. He was gentle in his house, and alive to the tenderest emotions. . . . His hospitality was active as well as cordial, embracing the worthy in every walk of life and seeking out deserving objects to receive it, no matter how obscure. . . . Abhorrence of debt, public and private, dislike of banks and love of hard money, love of justice, and love of country, were ruling passions with Jackson. Of private debts he contracted none of his own, and made any sacrifices to get out of those incurred for others." Mr. Bancroft, in an oration pronounced at Washington, June 27, 1845, in commemoration of the death of Jackson, thus characterizes him in retirement: "Behold the warrior and statesman, his work well done, retired to the Hermitage, to hold converse with his forests, to cultivate his farm, to gather around him hospitably his friends! Who was like him? He was the load-star of the American people. His fervid thoughts, frankly uttered, still spread the flame of patriotism through the American breast; his counsels were still listened to with reverence; and almost alone among statesmen, he in his retirement was in harmony with every onward movement of his time. . . . Age had whitened his locks and dimmed his eye, and spread around him the infirmities and venerable emblems of many years of toilsome service; but his heart beat warmly as in his youth, and his courage was firm as it had ever been in the day of battle. His affections were still for his friends and his country, his thoughts were already in a better world. . . . To the

majestic energy of an indomitable will, he joined a heart capable of the purest and most devoted love, rich in the tenderest affections. On the bloody battle field of Tohopeca he saved an infant that clung to the breast of its dying mother; in the stormiest season of his presidency, he paused at the imminent moment of decision, to counsel a poor suppliant that had come up to him for relief. . . . The sorrows of those that were near to him went deeply into his soul; and at the anguish of the wife whom he loved, the orphans whom he adopted, he would melt into tears and weep and sob like a child. No man in private life so possessed the hearts of all around him; no public man of this country ever returned to private life with such an abiding mastery over the affections of the people. No man with truer instinct received American ideas; no man expressed them so completely, or so boldly, or so sincerely. He was as sincere a man as ever lived. He was wholly, always, and altogether sincere and true. Up to the last he dared do any thing that it was right to do. He united personal courage and moral courage beyond any man of whom history keeps the record. Not danger, not an army in battle array, not wounds, not wide-spread clamor, not age, not the anguish of disease could impair in the least degree the vigor of his steadfast mind. The heroes of antiquity would have contemplated with awe the unmatched hardihood of his character; and Napoleon, had he possessed his disinterested will, could never have been vanquished. Jackson never was vanquished. He was always fortunate. He conquered the wilderness; he conquered the savage; he conquered the bravest veterans trained on the battle fields of Europe; he conquered everywhere in statesmanship; and when death came to get the mastery over him, he turned that last enemy aside as tranquilly as he had done the feeblest of his adversaries, and passed from earth in the triumphant consciousness of immortality."—The following are the most noted biographies of Andrew Jackson, and works relating to his career: "Life of Andrew Jackson, Major-General in the Service of the United States," by John Henry Eaton, U. S. senator (Philadelphia, 1824; 1st ed. about 1818); "Life of Andrew Jackson, President of the United States of America," by William Cobbett, M. P. (New York, 1834); "A Narrative of Events in the South of France, and of the Attack on New Orleans, in 1814 and 1815," by Capt. John Henry Cooke (London, 1835); the "Campaign of the British Army at Washington and New Orleans, in the years 1814 and 1815," by the author of the "Subaltern" (London, 1837); "Life of Andrew Jackson, Private, Military, and Civil," by Amos Kendall (New York, 1844); "Thirty Years' View; or a History of the Workings of the United States Government for 30 Years, from 1820 to 1850," by Thomas H. Benton (New York, 1854); and "Jackson and New Orleans; an Authentic Narrative of the

Memorable Achievements of the American Army, under Andrew Jackson, before New Orleans, in the Winter of 1814 and 1815," by Alexander Walker (New York, 1856). The latest and by far the most elaborate biography is by James Parton (3 vols. 8vo., New York, 1859 *et seq.*).

JACKSON, CHARLES, an American jurist, born in Newburyport, Mass., May 31, 1775, died in Boston, Dec. 13, 1855. He was the 3d son of Jonathan Jackson, a merchant greatly respected for his virtues and intelligence. He was graduated at Harvard college in 1793, and entered the office of Theophilus Parsons, then of Newburyport, as a student of law, and remained there 3 years. He then established himself as a lawyer in Newburyport, and rose rapidly into practice. In 1803 he removed to Boston, where he was also almost at once successful in acquiring business, in a community where Sullivan, Dexter, Gore, Otis, and Lowell were his competitors. For 10 years he held a conspicuous place as one of the leading members of the Suffolk bar. Entering into partnership with the late Judge Samuel Hubbard, the business of their office became more lucrative probably than that of any other law office had been in New England up to that time. In 1813 he relinquished this large practice to accept a place on the bench of the supreme court of Massachusetts. He discharged the duties of this office for 10 years, at the end of which he resigned it on account of impaired health. After recruiting his strength by a tour in Europe, he returned to Boston, where he continued to give legal advice as chamber counsel, but did not engage in active practice. He was an influential member of the convention of 1820 for amending the state constitution, though rarely participating in its open debates. In 1832 he was appointed one of the commissioners to revise the general statutes of the commonwealth of Massachusetts. He drew up the second part of the "Revised Statutes," and the whole work, as performed by himself and the commission of which he was the head, has received the highest praise from the most competent authorities. He was afterward appointed upon a commission to codify the common law, a task which the state of his health compelled him to relinquish. In 1828 he published a "Treatise on the Pleadings and Practice in Real Actions," which is spoken of by a distinguished legal scholar and advocate as "a work exhibiting thorough knowledge of that most abstruse portion of the law."—JAMES, an American physician, brother of the preceding, born in Newburyport, Oct. 3, 1777. He was graduated at Harvard college in 1796, in the same class with John Pickering and Leonard Woods. For 6 months after his graduation he was employed as English master at Leicester academy. During the next year he acted as clerk to his father, who was then an officer of the government. At the end of Dec. 1797, he became a medical pupil of Dr. Edward Augustus Holyoke of Salem. He studied nearly two years with

him, and then went to London, where he was a "dresser" in St. Thomas's hospital, and attended lectures at that and at Guy's hospital, under George Fordyce, Oline, Astley Cooper, William Saunders, and others. On his return to Boston he commenced practice there, and has continued in the same from that date (1800) to the present (1860). For more than 40 years of this period he has devoted himself entirely to medical practice, to the exclusion of surgery and other branches. In 1803 he became a member of the Massachusetts medical society. In 1810, in connection with the late Dr. John C. Warren, he brought before the community a proposition for establishing a hospital in the city of Boston. The first result of this was the organization of the asylum for the insane at Somerville, then included in Charlestown, and afterward of the Massachusetts general hospital in Boston. Dr. Jackson was the first physician, and Dr. Warren the first surgeon, to this institution. In 1810 he was chosen professor of clinical medicine in the medical department of Harvard college, and two years afterward professor of theory and practice in the same institution. In 1835 he resigned his place as physician to the hospital and his office in the medical school. His principal publications have been as follows: "On the Brunonian System" (1809); "Remarks on the Medical Effects of Dentition," in the "New England Medical and Surgical Journal" (1812); various articles in the "Transactions of the Massachusetts Medical Society," including some reports drawn up principally or entirely by him, viz.: "On Cow Pox and Small Pox," "On Spotted Fever," and "On Spasmodic Cholera;" "Syllabus of Lectures" (1816), and "Text Book of Lectures" (1825-'7), for the use of the medical class; a memoir of his son James Jackson, jr., who died in 1834, with extracts from his letters to his father, and medical cases collected by him (1835); "Letters to a Young Physician" (1855). Of the last work several editions have been printed.—PATRICK TRACY, an American merchant, brother of the preceding, born in Newburyport, Aug. 14, 1780, died in Beverly, Sept. 12, 1847. At the age of 15 he was apprenticed to William Bartlett, a merchant of Newburyport, and subsequently established himself in Boston in the India trade, in which he acquired a handsome fortune. In 1812, at the invitation of his brother-in-law, Francis C. Lowell of Boston, who had recently examined the process of the cotton manufacture in England, he engaged in a project to introduce the power loom, then newly invented, and the mode of constructing which was kept secret, into the United States. As the war then recently declared between the United States and England prevented communication with the latter country, they were forced to invent a power loom themselves, and, after repeated failures, succeeded in the latter part of 1812 in producing a model from which a machine was subsequently constructed by Paul Moody, an ingenious mechanic. In 1813 they

built their first mill at Waltham, near Boston, which is still in operation, and which is said to have been the first in the world that combined all the operations for converting the raw cotton into finished cloth, the practice among cloth manufacturers having previously been to buy the twist from which the fabric was to be woven of the spinners. In the modifications and improvements subsequently required in the machinery of the mill Mr. Jackson rendered material assistance. In 1821, with a view of permanently establishing the cotton manufacture in Massachusetts, he made large purchases of land on the Merrimack river near the Pawtucket canal, on which a number of mills were constructed by the Merrimack manufacturing company, a corporation organized under his auspices. This settlement formed the germ of the large manufacturing city of Lowell, subsequently erected on the spot. After superintending the formation of another company in the same place, he procured in 1830 a charter for a railroad between Lowell and Boston, the construction of which he directed with untiring energy until its completion in 1835. It was then probably the finest work of the kind in the country, being, according to the testimony of M. Michel Chevalier, "truly Cyclopean." Pecuniary reverses having overtaken him in 1837, he assumed the charge of the locks and canals company of Lowell, which controlled the land and water power and manufactured the machinery used in the mills, and by his efforts greatly benefited the company and the city, both of which had been affected by recent commercial disasters. Subsequently, as agent of the Great Falls manufacturing company at Somersworth, he brought the mills of that corporation to a state of remarkable efficiency. Apart from his efforts to develop the manufacturing resources of New England, he labored zealously to promote the moral and intellectual improvement of the operatives in his mills, and had the satisfaction of seeing that species of employment regarded as among the most respectable and popular open to females. He was a man of much cultivation and private worth, and enjoyed the esteem of all who knew him.—See memoir of P. T. Jackson, by John A. Lowell, in Hunt's "Lives of American Merchants" (2 vols. 8vo., New-York, 1856-'8).

JACKSON, CHARLES THOMAS, M.D., an American chemist, mineralogist, and geologist, born in Plymouth, Mass., June 21, 1805. He is descended on the father's side from Abraham Jackson, one of the first settlers of Plymouth, and on the mother's from the Rev. John Cotton, the early pastor of the first church of Boston. He lost his parents when he was 12 years old. For 3 years he attended a private school in Duxbury, Mass., and was then placed by his guardian in a mercantile house in Boston. He had already acquired a strong taste for electricity and chemistry, and devoted his leisure hours chiefly to experiments in those sciences, performed often with apparatus made by himself. At the end

of a year he quitted the counting house, and under private instruction began to prepare himself for entering Harvard college in the last term of the junior year. His health failed as he completed his preparatory course, and instead of entering college he made an excursion on foot through New York and New Jersey in company with several distinguished naturalists, among whom were Baron Lederer, and Messrs. McClure, Say, Lesueur, and Troost, making scientific observations and collecting objects of natural history. On his return to Boston he studied medicine under the instruction of Drs. James Jackson and Walter Channing, and received the degree of M.D. from Harvard university, Jan. 21, 1829. In the summer of 1827, while yet a student of medicine, he made, in company with Francis Alger of Boston, a mineralogical and geological survey of Nova Scotia, an account of which was jointly published by them in the "American Journal of Science" for 1828. In 1829 they revisited Nova Scotia, greatly extended their former survey, and collected a large number of minerals and fossils, which they presented to various scientific institutions in America and Europe. They afterward published a fuller account of the mineralogy and geology of Nova Scotia, together with a geological map of the province, in the "Memoirs of the American Academy of Arts and Sciences." In the autumn of 1829 Dr. Jackson embarked for Europe, where he remained 3 years, pursuing his medical and scientific studies at Paris. In 1831 he made a pedestrian tour through Switzerland, Piedmont, Lombardy, the Tyrol, Bavaria, and Austria. He was at Vienna during the prevalence of the cholera, assisted in the dissection of the bodies of 200 victims of the disease, and sent home a detailed account of his medical observations, which was published in the Boston "Medical Magazine" for 1832. He afterward visited the principal cities of Italy, and made a geological tour of Sicily in company with Professor Jameson Torrey, Dr. John Home of Edinburgh, and Alexander DeClouet of Louisiana. He made a very minute geological examination of Etna and Vesuvius and the volcanic Lipari islands, and afterward of the volcanic region of Auvergne in France. The summer of 1832 he passed in Paris, where he studied surgery in the hospitals. In Oct. 1832, he embarked for New York in the packet ship Sully, taking with him an electro-magnet, two galvanic batteries, and a variety of other philosophical apparatus. During the voyage a discussion arose among the passengers, of whom Prof. S. F. B. Morse was one, on the subject of electro-magnetic experiments, and their applicability to telegraphic use. Dr. Jackson claims that during this discussion he pointed out the possibility of telegraphic correspondence by means of electricity, and suggested several ways of accomplishing it. His plan as then developed in conversation he declares embraced the essential and peculiar features of the American telegraph patented in

1840 by Prof. Morse. Dr. Jackson also claims that in the spring of 1834 he constructed and successfully worked, and exhibited to Mr. Francis Alger and other friends, a telegraph combining the peculiar features of that which he had invented on board the Sully, though he did not think it could be profitably brought into public use till the invention of the sustaining battery by Daniell in 1837 furnished the means of obtaining a long continued voltaic current of uniform strength. A controversy arose in 1837 between Prof. Morse and Dr. Jackson in regard to their respective claims to the invention of the telegraph, the evidence respecting which has been printed for the use of the court and counsel in subsequent trials of cases between litigating proprietors of telegraphs. In 1833 Dr. Jackson settled in Boston, and entered upon the practice of medicine, which, however, in a few years he abandoned to devote himself to chemistry, mineralogy, and geology, his services being much in request for private geological surveys, examination of mines, and chemical analyses. In 1836 he was appointed state geologist of Maine, and directed to survey that state; and at the same time he was commissioned by Massachusetts surveyor of her public lands in Maine. These surveys occupied 3 years, during which time he prepared 3 annual reports for Maine and 2 for Massachusetts. The Maine reports fill a large 8vo. volume, with a 4to. volume of plates. In 1836, at the request of the secretary of state of New York, he drew up a plan of a geological survey of that state, which was adopted as the best proposed; and he was appointed by Gov. Marcy one of the state geologists of New York, but resigned the commission, preferring to continue upon the geological survey of Maine. This survey was interrupted by the boundary troubles with Great Britain, which absorbed the money in the state treasury and prevented further appropriations at that time for scientific purposes. In 1839 he was appointed state geologist of Rhode Island, and made a geological and agricultural survey of that state in one year, of which a report with a geological map was published in 1 vol. 8vo. In 1840 he was appointed state geologist of New Hampshire, and made a survey which occupied 3 years, the results of which, with maps and illustrations, were comprised in 1844 in a report in 1 vol. 4to. While this report was in press he explored the then unbroken wilderness on the southern shore of Lake Superior, and first made known to the public the wonderful mineral resources of that region. In 1845 he again visited Lake Superior and opened mines of copper and discovered mountains of iron ore, which were explored by his assistants, and are now extensively wrought. In 1847, congress having made an appropriation for a geological survey of the mineral lands of the United States in Michigan, Dr. Jackson was appointed to superintend it, and was thus engaged for two years, when, on a change of administration at Washington, the direction of

the survey was transferred to another. His report of these labors was published in 1850, in 1 vol. 8vo.—Dr. Jackson is one of the claimants for the honor of the discovery of anesthetics. His claims, as maintained by himself and his friends, are substantially as follows. In 1834 he discovered that an alcoholic solution of chloroform, when made to act locally on a nerve, renders it insensible to pain; and that if a piece of lint saturated with a mixture of one part of chloroform and three parts of alcohol is inserted into the cavity of a painful carious tooth, it allays the pain at once, and by repeated applications completely destroys the sensibility of the nerves. Having long before experimented with exhilarating gas or protoxide of nitrogen, he resumed in 1837 his experiments with that gas in order to test the comparative effects on the nervous system of different modes of administering it; but the only new result he obtained was to satisfy himself that the temporary insensibility which it sometimes produces is due in a greater or less degree to partial asphyxia, and is consequently dangerous. Subsequently, but previous to the winter of 1841-'2, having received from a chemist the present of some perfectly pure sulphuric ether, he tried its effects upon himself, administering it with a mixture of atmospheric air, and inhaled it to such an extent as to lose all consciousness, without suffering any of the dangerous or disagreeable consequences that had hitherto attended the inhalation of impure sulphuric ether unmingled with atmospheric air. In the winter of 1841-'2 he inhaled ether vapor for relief from the very severe pain occasioned by the accidental inhalation of chlorine, which is described by medical authorities as "quite as agonizing as the pain inflicted by the surgeon's knife." The relief he experienced led him, as he states in a subsequent letter to Baron Humboldt, to infer "that a surgical operation could be performed on a patient under the full influence of sulphuric ether, without giving him any pain." Dr. Jackson's claims to the discovery of anesthetics, disputed by Dr. W. T. G. Morton and Dr. Horace Wells, have given rise to a controversy not yet closed. In 1852 a memorial was presented to congress, signed by 143 physicians of Boston and its vicinity, ascribing the discovery exclusively to Dr. Jackson. About the same time the question was investigated by a committee of the French academy of sciences, and on their report the academy decreed a prize of 2,500 francs to Dr. Jackson, and another of 2,500 francs to Dr. Morton. M. Elie de Beaumont, now perpetual secretary of the academy, remarked in a letter to Dr. Jackson, dated May 17, 1852: "In point of fact, the academy of sciences decreed one of the Monthyon prizes of 2,500 francs to you for the discovery of etherization, and it has decreed a prize of 2,500 francs to M. Morton for the application of this discovery to surgical operations." In 1849 Dr. Jackson received from Louis Napoleon, then president of the French republic, the cross

of the legion of honor, and from King Oscar of Sweden a gold medal struck expressly for him. In 1857, on the recommendation of Humboldt, to whom the documents in evidence on the ether question had been referred, he received from King Frederic William of Prussia the order of the red eagle; and he has received orders and decorations from the sultan of Turkey and the king of Sardinia. Among his scientific discoveries may be mentioned that of chlorine in meteoric iron, and of fluorine as a component part of the scales of ganoid fishes, as the gar pikes of the western and southern rivers and lakes; of a method of separating and preparing pure gold in the state of a metallic sponge, by the action of potash and oxalic acid on its chlorine solution; of a large vein of phosphate of lime in Hurdstown, N. J.; of new trilobites in Newfoundland rocks; of fossil fishes in the lower coal measures of New Brunswick; of veins of tin in Jackson, N. H.; of tin in ore from Los Angeles, California; of the meteoric character of a mineral found in Oregon, containing chrysolites, and of its close resemblance to the great Pallas meteorite found in Siberia; and the discovery of new minerals, or of new localities of rare and valuable minerals before known, as of masonite, since named chlorotoid, in Rhode Island; of chloro-phyllite or hydrous iolite, in Unity, N. H.; of chlorastrolite in Isle Royale, Lake Superior; of tetradymite, an ore of tellurium and bismuth, in Virginia; and of bornite, a tellurium and bismuth ore, in Georgia. Beside the geological reports above mentioned, Dr. Jackson has furnished numerous scientific communications to the "American Journal of Science and Arts," to the *Comptes rendus des séances de l'académie des sciences*, and to the *Bulletin de la société géologique de France*. He has also published in the U. S. patent office agricultural reports, the results of chemical researches on the cotton plant, the tobacco plant, on Indian corn, and on 38 varieties of American grapes.

JACKSON, HENRY R., an American author and diplomatist, born in Savannah, Ga., in 1810. He is the son of Dr. Henry Jackson, formerly professor of natural history in Franklin college, Athens, and received his education at that seminary. He was subsequently admitted to the bar, and for several years held the appointment of U. S. district attorney for Georgia. He was also at one period one of the editors of the "Savannah Georgian." At the commencement of the Mexican war he raised a company of men, subsequently incorporated with the Georgia regiment of volunteers, of which he was elected colonel, and served with his command in Mexico. In 1849 he was elected one of the judges of the Georgia eastern circuit, which office he filled until 1853, when he was appointed by President Pierce chargé d'affaires at Vienna. In the succeeding year he became minister resident, in which capacity he remained until 1858, when he returned to the United States. He is the author of a volume entitled "Tallulah and other

Poems" (Savannah, 1851), many of the pieces in which were suggested by local tradition or scenery, and evince a genuine affection for his native state and her history.

JACKSON, JAMES, an American soldier and statesman, born in Moreton Hampstead, Devonshire, England, Sept. 21, 1757, died in Washington, D. C., March 19, 1806. He emigrated to America with his father in 1772, and studied law in Savannah. In March, 1776, he aided in repelling a British attack upon that town, and subsequently was appointed brigade major of the Georgia militia. After the capture of Savannah in 1778, he made his escape to Carolina and joined Moultrie's brigade. On the way he narrowly escaped being hanged as a spy by a party of whigs, whose suspicions were excited by his miserable appearance. He participated in the unsuccessful assault upon Savannah by Lincoln and D'Estaing in 1779, and in the battle of Blackstocks in the succeeding year. About this time he was severely wounded in a duel, his adversary, Lient. Gov. Wells, being killed. In 1781 he aided in the capture of the fort at Augusta, and was left in command of the place. He fought with great valor in a number of engagements in this and the succeeding year, and upon the evacuation of Savannah by the British in 1782 was appointed by Gen. Wayne to receive the keys of the place, "in consideration of his severe and fatiguing services in advance." The Georgia legislature subsequently presented him with a residence in Savannah. After the termination of the war he entered upon a lucrative practice at the bar, by which he acquired a competency. He participated largely at the same time in public affairs, and in 1783 commenced his legislative career as a member of the general assembly. In 1788 he was elected governor of the state, but in consequence of his youth and inexperience declined the honor. In 1789 he was chosen a representative in congress, and from 1792 to 1795 he was a member of the U. S. senate. He had previously by successive promotions attained the rank of major-general of the state militia. He had the principal share in the framing of the Georgia constitution of 1798, and upon its adoption was elected governor of the state, and held that office until his reelection in 1801 to the U. S. senate. He died while in the active discharge of his legislative duties, and was buried in the congressional cemetery at Washington, where a monument, with an inscription written by his friend, John Randolph of Roanoke, was erected to his memory. He was a man of great impetuosity of temper, but of approved integrity and patriotism.

JACKSON, JOHN, an English painter, born in Lasingham, Yorkshire, in 1778, died in London, June 1, 1831. He was liberally assisted in his youth by Sir George Beaumont, and eventually acquired a reputation as a portrait painter not inferior to that of Sir Thomas Lawrence and the best artists of the day. His chief characteristics were strength and effectiveness. He

was also remarkable for the rapidity with which he worked, having on one occasion for a wager painted the portraits of 5 gentlemen in a single day, for each of which he received 25 guineas. He was a royal academician, and painted the portraits of many of his associates, among which that of Flaxman is highly commended.

JACKSON, WILLIAM, an English composer, born in Exeter in 1730, died in 1803. He pursued his musical studies in London under Traversers, and in 1777 became organist of Exeter cathedral. He is celebrated in England for his songs, canzonets, and trios, which display remarkable tenderness and grace. As a composer of instrumental music he was less successful. He wrote "Thirty Letters on Various Subjects," and "Four Ages, together with Essays." He also attained proficiency in painting.

JACKSONVILLE, the capital of Morgan co., Ill., situated near Mauvaiseterre creek, an affluent of the Illinois, 34 m. W. from Springfield, and 222 m. S. W. from Chicago; pop. in 1850, 2,745; in 1855, about 5,000. It is on the line of the great western railroad, at its junction with 3 other roads which are yet unfinished—the Jacksonville, Alton, and St. Louis; the Tonica and Petersburg, and the Illinois river railroads. It is pleasantly built in the midst of an undulating and fertile prairie, and is one of the most flourishing interior towns in the state. It has 5 or 6 churches, a Methodist female seminary, 2 or 3 other academies, a weekly newspaper office, a mechanics' association, saw mills, flour mills, manufactories of cotton yarn and oil, a tannery, 2 founderies, a plough factory, 2 hotels, and 2 banking establishments. It is the seat of Illinois college, founded in 1830, which in 1859 had 7 professors, 70 students, and a library of 3,660 volumes; of the Illinois institution for the education of the deaf and dumb, with 150 pupils; of the state institution for the blind, with 68 pupils; and of a state hospital for the insane, with 229 inmates. The asylums are well arranged and prosperous, and the Illinois college is one of the finest establishments for education in the state.

JACOB, the third and last of the Hebrew patriarchs, son of Isaac and Rebekah, and younger twin brother of Esau. Even in his mother's womb he and Esau struggled together and were declared by the Lord to be the founders of two nations, and he was called Jacob (heel-holder) because his hand took hold on his brother's heel at birth. Esau was a hunter and the favorite of Isaac, but Rebekah loved the gentler Jacob. In his youth Jacob purchased his elder brother's birthright for some bread and pottage of lentiles, given to him when he was famishing. At the instigation of his mother he obtained by fraud from his blind father the blessing of the first born. Obligated to flee from his brother's wrath, he went at the command of his father to take a wife from the daughters of Laban, his mother's brother. On his way he saw in a dream the vision of a ladder reaching to heaven, which established him in the belief that he was the heir of the promise

made to Abraham. He served 7 years for the love of Laban's daughter Rachel, and was then deceived by finding in his veiled bride her elder sister Leah. He served another 7 years for Rachel, and 6 years longer for a herd, which he greatly increased by an artifice, and then departed with his wives, children, and possessions for the land of Canaan. On his way he met and was reconciled with Esau, immediately preceding which "there wrestled a man with him until the breaking of the day. And when he saw that he prevailed not against him, he touched the hollow of his thigh, and the hollow of Jacob's thigh was out of joint, as he wrestled with him. . . . And he said, Thy name shall no more be called Jacob, but Israel; for as a prince hast thou power with God and with men, and hast prevailed." He tarried successively at Succoth, Shechem, and Bethel, where the Abrahamic covenant was renewed to him. While journeying toward the residence of his father at Mamre, Rachel died in giving birth to Benjamin. Among his domestic troubles was the loss of his favorite son Joseph, sold by his brethren and carried to Egypt, where he became the highest officer at court. In a famine which followed, Joseph established his father and brethren in Egypt under his protection, and Israel lived 17 years in the land of Goshen, where he died at the age of 147 years. At his own command he was buried with Abraham and Isaac near Mamre. He was the father of Reuben, Simeon, Levi, Judah, Issachar, and Zebulun by Leah; of Joseph and Benjamin by Rachel; of Dan and Naphthali by Bilhah, Rachel's handmaid; and of Gad and Asher by Zilpah, Leah's handmaid; also of a daughter, Dinah, by Leah. These 12 sons became the heads of the 12 tribes of Israel, and before his death he assembled them and gave them his prophetic blessing.

JACOB, JONX, an English officer, born in Woolavington, near Bridgewater, in Jan. 1812, died in Jacobabad, Sind, Dec. 5, 1858. He was educated by his father, the Rev. S. L. Jacob, was 2 years in the East India company's military seminary at Addiscombe, and sailed for India in 1826, as a cadet in the Bombay artillery. In the early part of his career in India, he became known as a skilful mechanic and a fearless rider. He was appointed in 1842 to the command of the Sind horse, a corps of 1,600 men, in which under Jacob's care it is said a court martial was never held. In consequence of the exertions of Jacob and his soldiers, the country became inhabitable; cultivation began; on the site of the old mud fort of Khanghur rose the flourishing town of Jacobabad, named after him, and now containing a population of 10,000; and industry and plenty, with full security for life and property, have succeeded scenes of rapine and disorder. The Sind horse distinguished themselves under Sir Charles Napier at the battles of Meeanee, Hyderabad, and Shahdappoor. At the latter place Jacob with a force of about 800 defeated the army of Shere Mohammed, numbering from 8,000 to 10,000 men. In

1851 he published "Remarks on the Bengal Army," which gave umbrage to his military superiors. In 1854 he was intrusted with the mission of negotiating a treaty with the khan of Kelat. Having devoted much attention to the improvement of rifled fire-arms, he succeeded at last in perfecting his "percussion rifle shells," which have repeatedly proved effective against a battery of field artillery at a distance of above a mile. The "Edinburgh Review," in an article on "Rifle Guns and Modern Tactics" (1859), says: "When in command of the Sindie horse, he conducted at his own expense at Jacobabad a series of experiments in rifles, on a scale seldom undertaken even by the most enlightened governments. The result was the production of a short-barrelled 4-grooved rifle. It is now a matter of considerable doubt whether Gen. Jacob's rifle or that manufactured at Enfield is on the whole the best weapon for warlike purposes." Promoted in 1855 to the rank of lieutenant-colonel, he was appointed in 1856 acting commissioner of Sindie. He abolished the system of forced labor, and the practice of torture by the native police. At the end of 1856 he accompanied the expedition to Persia as commander of the cavalry division, with the rank of brigadier-general. On the termination of the war, and on the departure of Gen. Sir James Outram, he was left in command at Bashire. In the beginning of 1857 he returned to Jacobabad, and was invested with the political and military charge of the frontier. During the revolt of 1857-'8 Jacob's troops maintained their fidelity, and the tranquillity of the Sindie frontier remained undisturbed. In reward for his services he received in 1857 the complimentary appointment of aide-de-camp to the queen. "Tracts on the Native Army of India," and a collection of his "Views and Opinions," edited by Capt. Lewis Selby, were published in London in 1858.

JACOBÆA, PURPLE (*senecio elegans*, Aiton), a biennial border flower of tender habit, and easily propagated by cuttings. These, when struck in the autumn and protected through the winter, may be planted out in May, and will make handsome plants, flowering all summer. It is a native of the Cape of Good Hope. The variety with double or multiplex flowers is most esteemed. In a good soil it blooms well in the greenhouse; and when employed as a decorative plant, it adds much to the general effect of the winter condition of such structures.

JACOBÆA LILY (*amaryllis formosissima*, Willd.), a superb-flowered, bulbous plant, native of tropical America. The bulbs are large, externally covered with a dark, dry skin, and end in a long flattened neck. Planted out in rich soil of the open border in the latter part of May or first of June, there soon appears a large, irregular-corolled blossom, having 3 of its petals declined and bent downward and wide apart from the others, so as to present a somewhat ringent look. At the apex of the stigma a clear, viscid drop exudes just previous to impregnation; this, sparkling in the sunlight, contrasts finely

with the deep, gorgeous crimson purple of the petals. These rich flowers, however, soon fade away, and are succeeded by the foliage, which grows to considerable size and length of leaves, until overtaken by the autumn frosts, when the bulbs should be carefully taken up and dried thoroughly. The Jacobæa lily is likewise much cultivated in pots. In this case, a good soil may be prepared for it by mixing 3 parts of fresh loam, 3 parts of completely decomposed manure, 3 parts of vegetable mould from old rotted leaves, and one part of sea sand. These should be thoroughly mixed, and the pots well drained with pieces of broken tiles, the necks of the bulbs being exposed above the surface of the soil. A single bulb, or in one of larger size 2 or 3 bulbs, may be planted in the pot. The flowers soon after appear, if the bulbs used are sufficiently large and strong. It has been found best to encourage a vigorous growth of the foliage as long as it shows any tendency to grow; but on its inclining to enter into a temporary state of rest, the bulbs may be kept dry for a few weeks.

JACOBI, FRIEDRICH HEINRICH, a German philosopher, born in Düsseldorf, Jan. 25, 1743, died in Munich, March 10, 1819. In his 18th year he was sent to Geneva to complete his apprenticeship for the mercantile career to which he was destined, and during a residence there of 3 years studied under the most celebrated professors in the departments of mathematics, medicine, and philosophy. He also familiarized himself with French literature, and conceived a special admiration for the writings of Rousseau. On his return to Düsseldorf, he was placed at the head of his father's mercantile establishment, was soon after married, and in 1770 renounced commerce, being appointed councillor of finance for the duchies of Berg and Juliers. This position allowed him to indulge his tastes for literature and philosophy, and he was soon associated or in correspondence with Wieland, Goethe, Herder, Lessing, Hamann, Lavater, Richter, Kant, Fichte, Reinhold, and other leading thinkers. His country seat at Pompelfort, near Düsseldorf, was after Weimar and the university towns the most remarkable literary centre in Germany. On the French invasion in 1794 he took refuge in the north of Germany, and passed 10 years in Wandsbeck, Hamburg, and Eutin, engaged in literary and philosophical studies, till in 1804 he was called to Munich as a member of the newly formed academy of sciences, of which he became president in 1807. He resigned this office in 1813, but its title and salary were continued to him till his death. In youth Jacobi had been led to singularly intense religious and philosophical meditations. At the age of 8 years the idea of eternity struck him so clearly and forcibly that he fell down fainting and with a shriek. The thought of annihilation and the perspective of an infinite duration long weighed equally upon his mind as terrible and insupportable conceptions. It is recorded that the perusal of Kant's tractate on the proofs for the being of a God produced on

him the most violent palpitation of the heart. He at length was able to check this intellectual susceptibility, but even in 1787 he affirmed his belief that, if he should yield to it instead of avoiding it, a few successive shocks would kill him. His first works were the philosophical romances *Woldemar* (Flensburg, 1779) and *Eduard Albrecht's Briefsammlung* (Königsberg, 1781), the former of which reveals his ethical system, making morality a matter of instinctive sentiment, rational intuition, or divine impulse, and exhibits an enthusiastic disinterestedness of love and a romantic mysteriousness in the attachments of the heart, which are very ingeniously described, but have often been called quite foreign to nature. As a philosopher, it was never his purpose to develop any connected system, and his philosophical writings are all of a brief and somewhat occasional character. The first of them was *Ueber die Lehre des Spinoza, in Briefen an Mendelssohn* (Breslau, 1785), in which he assails Spinozism as a type of all formal, rationalistic, demonstration-seeking systems, and affirms that every path of philosophical demonstration can lead only to fatalism and atheism. To demonstrate any truth we must infer it from another lying behind it; this, again, from another; and so on, to an infinite series. The human understanding, therefore, never gets beyond a series of conditions, never rises to first principles, never touches the infinite, or reaches to universal and purely philosophical truth. It is even for the interest of science that there should be no God, no supernatural and extramundane Being, since only upon the supposition that nature is all in all can science ever hope to gain its goal of perfection. Thus he affirms that the understanding, taken by itself, is materialistic, and denies spirit and God; and that the reason, taken by itself, is idealistic, has nothing to do with the understanding, and denies nature and makes itself God. He therefore proposes a doctrine of faith, which he calls the *salto mortale* of the reason, and which furnishes ultimate intuitions that are the immediate foundation of all knowledge. This doctrine is more fully developed in his dialogue entitled *David Hume über den Glauben, oder Idealismus und Realismus* (Breslau, 1787). As our faith in the intuitions of sense is the sole foundation of our knowledge of matter, so there is a higher species of faith, a rational intuition, a spiritual faculty, a sort of transcendental feeling, which immediately and positively reveals supersensual things. Thus objects, such as God, providence, freedom, immortality, and moral distinctions, come to us not by demonstration, but are gazed upon directly by the inward eye; and we are as certain of their reality as of that of the objects seen by the bodily eye. It is by this double faith in material and spiritual realities that man has access to the whole domain of truth, and gains the materials which may be variously moulded and employed by the understanding. But without it, all philosophy is but a play with words,

a superstructure that, however complete in itself, is as baseless as the most airy visions of the imagination. His relation to the Kantian critical philosophy appeared in his essay *Ueber das Unternehmen des Kriticismus, die Vernunft zu Verstande zu bringen* (1802). While Kant regarded the perceptions of sense as subjectively formed phenomena, which did not represent but only declared the existence of objective realities, Jacobi affirmed that the perceptions were matters not only of sense but of faith, and were full and adequate intuitions of outward realities. The notions of God, of the soul, of immortality, and of rectitude, which Kant had admitted through the medium of the practical reason, Jacobi maintained to be as valid as the ideas of the pure reason, and the faculty which he had before called faith he now named reason (*Vernunft*), and made it a direct revelation of spiritual things. He thus fortified our mental constitution against the sweeping results of the rising idealism, claiming that the soul was more than a mechanism of logical thinking and shadowy representations, and that its highest faculty was one of feeling or faith, which was a certain basis of realism in philosophy. Opposed to all methodical systems, he cherished both as a dogma and as a mystical doctrine an imperturbable faith in the objective truths of sentiment and reason, against whatsoever doubts and criticisms. Hegel thus describes him: "Jacobi is like a solitary thinker, who, in the morning of his day, found some ancient riddle, hewn upon an eternal rock. He believes in this riddle, but he strives in vain to guess it. He carries it about with him the whole day, allures weighty sentences from it, spreads it out into doctrines and images, which delight the hearer, and inspire him with noble wishes and hopes. But the interpretation fails; and in the evening he lays him down, with the hope that some divine dream, or the next waking, will pronounce to him the word for which he longs, and in which he has so firmly believed." His style is at once poetical and philosophically accurate, and has been often compared to that of Plato. His principal works, beside those already mentioned, are *Sendschreiben an Fichte* (Hamburg, 1799), and *Von den göttlichen Dingen und ihrer Offenbarung* (Leipsic, 1811), which occasioned a controversy with Schelling. His collected works were published at Leipsic (6 vols., 1812-'24), to which his letters were added (2 vols., 1825-'7).—JOHANN GEORG, brother of the preceding, a German poet, born in Düsseldorf, Dec. 2, 1740, died in Freiburg, Baden, Jan. 4, 1814. After studying theology and general literature at Göttingen, he was appointed in 1765 professor of philosophy and eloquence at Halle, became soon after intimately associated with Gleim, in 1769 received a canonry at Halberstadt, and devoted himself to poetry till in 1784 he accepted a professorship of belles-lettres at Freiburg. His poems are marked especially by grace and purity of diction. His complete works were published at Zürich (8 vols., 1807-'22).—

MAXIMILIAN, son of F. H. Jacobi, a German physician, born in Düsseldorf, April 10, 1775, died in Siegburg, Rhenish Prussia, May 18, 1858. He studied at Jena, Göttingen, Edinburgh, and Erfurt, and was graduated M.D. in 1797. He was for a time assistant in a London hospital, and afterward director of an insane asylum at Saltzburg. He early embraced the views of Pinel and Tuke on the subject of non-restraint, and sought to introduce them throughout Germany. In 1820, when it was determined to establish an insane hospital at Siegburg, he was selected to take charge of it. He published several essays upon the treatment of the insane, and a work on the "Construction and Management of Lunatic Hospitals" (1834), and was a frequent contributor to the *Allgemeine Zeitschrift für Psychiatric*. On the 50th anniversary of his doctorate, a festival was held in his honor, which was attended by distinguished men from England and France as well as from every part of Germany. At this festival an association was organized, called the Jacobi foundation, having for its object the improvement of physicians, officers, nurses, and attendants in the care of the insane.

JACOBI, KARL GUSTAV JAKOB, a German mathematician, born in Potsdam, Dec. 10, 1804, died in Berlin, Feb. 18, 1851. At the university of Berlin he divided his time between philology, philosophy, and mathematics, and was distinguished for his clearness of intellect. In 1825, on the recommendation of Hegel, he was sent to Königsberg as instructor in mathematics, and was appointed to the mathematical professorship there in 1829. In 1842 he made a journey to England, but on his return was obliged by ill health to resign his professorship, and after visiting Italy resided in Berlin. His importance in the history of mathematics is chiefly due to his discoveries in the theory of elliptic functions, and his principal work is the *Fundamenta Nova Theoriæ Functionum Ellipticarum* (Königsberg, 1829), beside which he wrote many special memoirs. Under him, Bessel, and Neumann, the university of Königsberg enjoyed a reputation as a school of mathematics surpassed by none in Europe.—MORITZ HERMANN, brother of the preceding, a German savant resident in Russia, born in Potsdam about 1790. At the age of 28 years he went to Russia to seek his fortune, and soon attracted attention by his researches in physics. In 1830 he constructed a short electric telegraph in St. Petersburg, and in 1832 one of 18 miles between two of the imperial residences, on which he made many experiments, and the important discovery that the earth could be used to complete the electric circuit. In 1840 he published his work *Die Galvanoplastik*, which gained him admittance into the imperial academy of St. Petersburg. He soon after proposed to the czar Nicholas the formation of a regiment of galvanic sappers, to be trained in the management of electricity. An immense battery was constructed for him, and he received the title of colonel in the galvanic

regiment. He has published many memoirs on the applications of electro-magnetism in the collections of the academy of St. Petersburg.

JACOBINS, the most celebrated of the clubs of the first French revolution. Its origin is traced to a political society established a few days after the opening of the states-general at Versailles, in 1789, by the deputies from Brittany, called the *club Breton*. On the removal of the constituent assembly from Versailles to Paris, this club established itself there in the old convent of Dominican friars or Jacobins, in the rue St. Honoré, admitted any citizen who was presented by 4 of its members, and assumed the new name of *société des amis de la constitution*, but was also, from its place of meeting, styled Jacobins, which shorter appellation generally prevailed. It soon became very numerous, not only deputies, but all who aspired to political influence, seeking admission to it. Every political question and every motion was here debated before being presented to the national assembly; the most popular orators participated in the debates, and were anxious to secure the favor of the majority; the club became the controlling power of the revolution. Extreme opinions gaining the ascendancy in it, its original founders abandoned it, and established another club, the *société de 1789* or *des Feuillants*, where more moderate notions were entertained. The only result of this political schism was to make the Jacobins more radical and boisterous. They extended their influence all over France, no fewer than 1,200 branch societies being established previous to 1791, and this number increased in the following years. All the affiliated societies obeyed orders from the head-quarters in Paris. The *Journal de la société des amis de la constitution* was, in May, 1791, added to the ordinary means of correspondence, and used in conveying revolutionary principles to every corner of the kingdom. The Jacobins were foremost in the insurrectionary movements of June 20 and Aug. 10; they originated the revolutionary *commune de Paris*, which became a formidable power, and changed their former name to a more expressive one, *les amis de la liberté et de l'égalité*. From this time they ruled supreme, and the convention itself was for a while but a tool in their hands. Robespierre was indebted for his political supremacy to the popularity he had secured among them. The revolution of the 9th Thermidor, which overthrew that dictator, was a fatal blow to the Jacobins; the terror they had inspired gradually vanished; the reactionary party, styled *la jeunesse dorée*, went in force to attack their head-quarters, Nov. 9, 1794, and the convention issued a decree which ordered the suspension of their meetings, and the closing of their hall. The scattered remains of the party attempted to regain influence by establishing the *club du manège*, and then the *club de la rue du Bac*, but in vain.

JACOBITES. I. A Christian sect in the East, particularly in Syria and Mesopotamia. They

derive their name from Jacobus Baradaeus, bishop of Edessa, who in the 6th century established a permanent ecclesiastical organization among the Monophysites, or those who maintained that the divine and human natures in Jesus Christ were so united as to form only one nature. At the death of Baradaeus in 578, this sect was very numerous in Syria, Mesopotamia, Armenia, Egypt, Nubia, and Abyssinia. The Egyptian Jacobites in the course of ages separated from their Asiatic brethren, and formed the Coptic church. (See COPTS.) The Asiatic Jacobites number altogether about 200,000 persons, and are divided into two sects, each governed by a patriarch, one of whom resides at Diarbekir, and bears the title of patriarch of Antioch; the other resides in a monastery near Mardin. The Jacobites practise circumcision before baptism. In their church service they use the Syriac language, which is no longer understood by the people. II. (Lat. *Jacobus*, James.) A party in Great Britain who after the revolution of 1688 adhered to the cause of the dethroned King James II. and his descendants. They were numerous and powerful in Scotland, and for more than half a century continued to conspire for the restoration of the exiled house of Stuart. They rose in unsuccessful revolt in 1715, and again in 1745. Their final extinction as a party may be dated from the death of the pretender Charles Edward in 1788, though they had long before ceased to be formidable to the established government.

JACOBS, PAUL EMIL, a German painter, born in Leipsic about 1800. He studied in the academy of Munich, and established his reputation as a historical painter by the production of the "Flight to the Wilderness" and "Adam and Eve finding the Dead Body of Abel." Between 1826 and 1834 he resided in Rome, where he painted many pictures after the elevated manner of Raphael, including the "Resurrection of Lazarus" and the "Rape of Proserpine." Subsequently he produced many important historical pieces. His "Judith and Holofernes" and "Samson and Delilah" received prizes at the exhibition in Philadelphia in 1850. He is at present court painter to the grand duke of Saxe-Coburg.

JACOBUS, an English gold coin struck in the reign of James I., worth 25 shillings. There is also the new Jacobus, sometimes called Carolus, worth 23 shillings.

JACOTOT, JOSEPH, a French educator, known for the system of instruction which bears his name, born in Dijon, March 4, 1770, died in Paris, July 30, 1840. After completing his collegiate studies in his native city, he was appointed, when scarcely 19 years old, professor of Latin and Greek literature. In 1792 he enlisted among the volunteers of the Côte d'Or, was elected captain of artillery, and participated in the campaign of Belgium. He was then called to Paris to be the assistant of Fourcroy in the central board for the manufacture and improvement of gunpowder; and afterward returned to Dijon, where he held in succession the chairs

of mathematics and of Roman law. During the Hundred Days he was elected to the chamber of deputies, favored the cause of Napoleon, and was consequently compelled to leave France. He took refuge in Belgium, where he first made a living by private teaching; in 1818 he received an appointment as lecturer on the French language and literature in the university of Louvain, and a little later became director of the military school of Belgium. He now brought forward his new system of intellectual emancipation, which attracted considerable attention. Visitors crowded to Louvain to be initiated into a method which would enable every one to learn without the aid of a teacher. Jacotot declined all compensation, and was untiring in his efforts to impart his principles and make his process of teaching generally available. In 1830 he returned to his native country, lived for 7 years in Valenciennes, and then repaired to Paris, where he spent his last years in comparative obscurity. He published *Enseignement universel: Langue maternelle* (Louvain, 1822); *Langue étrangère* (1823); *Musique, dessin et peinture* (1824); *Mathématiques* (1828); *Droit et philosophie pancastiques* (Paris, 1835); beside a number of articles in the *Journal de l'émancipation intellectuelle*, which he had established for the diffusion of his doctrine.

JACQUARD, JOSEPH MARIE, a French mechanician, inventor of the mechanism called from him the Jacquard loom, born in Lyons, July 7, 1752, died in Oullins, near Lyons, Aug. 7, 1834. His parents were employed in Lyons as weavers, and his father, having become the proprietor of a loom, was enabled to give him a few months' schooling, the only education he ever received. At 12 years of age he was apprenticed to a bookbinder, and subsequently in succession to a cutler and a type-founder, in which occupations he evinced his mechanical genius by the production of a variety of models and inventions. At about the age of 20 he succeeded, upon the death of his father, to a small workshop containing two looms, and commenced business as a weaver. Absorbed in plans for improving looms, and in a variety of other mechanical schemes, he neglected his business, and not only exhausted his father's savings, but was obliged to sell his workshop and fixtures to pay his debts. Nevertheless he married the daughter of an armorer, hoping with the aid of her dowry to retrieve his fortunes. In this he was also disappointed, and, houseless and penniless, he was finally obliged to seek employment with a lime burner in Bresse, while his wife gained a scanty living for herself and her son in Lyons by making straw bonnets. From about 1777 to 1792 there is no account of his life, which was probably passed in unceasing struggles with poverty; in the latter year he embraced the cause of the revolution, and in 1793 was one of the defenders of Lyons against the army of the convention. After the reduction of the city he fled with his son, a boy of 15; and both were soon after enrolled in the army of the Rhine.

They fought side by side in several engagements; but upon the death of his son in battle Jacquard returned to Lyons, and joined his wife in the occupation of straw weaving. When Lyons began to recover from the effects of the siege, and her mechanics to return from abroad, he found employment with a wealthy and intelligent silk manufacturer, who encouraged his schemes for the improvement of pattern-weaving machinery. With a view of substituting mechanical action for that of a numerous class of workmen, who, by the very nature of their employment, were doomed to a premature death, he produced in 1800 the first model of his apparatus for superseding the use of draw-boys in weaving figured goods, the idea of which had occurred to him, it is said, as early as 1790. In addition to the economy of labor which the apparatus effected, it greatly simplified the weaving of rich designs, and could be readily applied at slight expense to any loom. He exhibited his invention in the exposition of national industry in 1801, and obtained a bronze medal, to quote the language of the jury, "for a machine for superseding the employment of a workman in the manufacture of figured goods." Not long after this he produced an ingenious machine for weaving nets without the use of a shuttle, which came under the notice of the prefect of police, and procured for the inventor a summons to appear before that functionary. Subsequently he and his machine were conveyed to Paris and underwent an examination by Napoleon and Carnot, the latter of whom asked Jacquard if he were the man who pretended to do the impossible, *i. e.*, to tie a knot in a stretched string. So satisfactory did the explanation prove that Jacquard received a gold medal, and was commissioned to examine and repair the machines and models in the *conservatoire des arts et métiers*, among which was a loom invented by Vaucanson, which is said to have suggested to him the principal improvements embraced in his own machine. This, however, is believed to be erroneous, as his obligations to the Vaucanson loom were comparatively unimportant. In 1804 he returned to Lyons to find himself assailed by abuse and open violence from those whom the introduction of the Jacquard apparatus had temporarily thrown out of employment. He was denounced as the enemy of the people, and the man who was reducing families to ruin and starvation; his house was entered by an infuriated mob, who broke in pieces one of his looms; and on several occasions he barely escaped from their rage with his life. These scenes of violence, however, soon gave place to a general acquiescence in the invention, which was purchased by government in accordance with an imperial decree, dated Berlin, Oct. 27, 1806, and made public property. Such was the increased production of woven fabrics in Lyons, and the rapid growth of the city consequent upon this act, that Jacquard came to be as highly esteemed as he had formerly been detested. Although strongly urged to settle in

England, he preferred to devote himself to perfecting his invention in his native city, where he lived until the death of his wife, to whom he was tenderly attached. He passed the latter years of his life in the neighboring village of Oullins. During his life he received the cross of the legion of honor, and in 1840 a statue of him was erected in Lyons. (See WEAVING.)

JACQUEMONT, Victor, a French traveller and naturalist, born in Paris, Aug. 8, 1801, died in Bombay, Dec. 7, 1832. After studying botany under Adrien de Jussieu, he visited North America and Hayti. While in Hayti he planned a scientific voyage to the East Indies, and, laying his project before the directors of the museum of natural history, received the appointment of naturalist and traveller to that institution. Returning to France, and afterward visiting England, he was elected fellow of the Asiatic society, and finally sailed from Brest in Aug. 1828. After touching at Teneriffe, Rio Janeiro, the Cape of Good Hope, Bourbon island, and Pondicherry, he arrived at Calcutta, May 5, 1829. Here he was hospitably entertained for several months by the English residents; and having acquired some knowledge of Indian languages, he started on his travels by land, Nov. 20, 1829. After visiting some of the English provinces, he explored the Himalaya mountains toward Thibet, and penetrated as far as Chinese Tartary. Returning westward, he was invited by his countryman Gen. Allard to the kingdom of Lahore, where Runjeet Singh received him with marked favor, and offered him the viceroyalty of Cashmere. Jacquemont however resumed his travels, and while at Poonah, June 5, 1830, was seized with cholera; having recruited, he repaired to Bombay, where he died of an inflammatory disease of the liver contracted in his ramblings through the pestilential forests of Salsette island. His *Correspondance* with his friends and relatives (2 vols. 8vo., Paris, 1834) is one of the most attractive and original books of travels ever published; while the diary of his *Voyage dans l'Inde, pendant les années 1828 à 1832* (6 vols. 4to.), published at the expense of the French government, embodies a large amount of valuable zoological and botanical observations.

JACQUERIE, a name applied to the French peasantry who revolted against the nobles during the captivity of the French King John in England in 1358. After the disastrous battle of Poitiers, the poor country people, who were mercilessly oppressed by the barons, rose in arms against their tyrants in Picardy, Champagne, and Isle of France; under the command of Guillaume Caillet, they attacked and destroyed the castles of their oppressors, murdered them, and subjected their wives and daughters to awful tortures and outrages. For a few months they spread terror over the N. E. of France. The nobles at last marched in force against them. Charles the Bad, king of Navarre, took their chief prisoner, and had him crowned with a red-hot iron tripod, and then beheaded. A few

weeks later the Captal de Buch and Gaston Phébus, count of Foix, slaughtered 7,000 of these rebels in the vicinity of Meaux, and thus put an end to this short war of devastation. The *Jacques* derived their name either from the jacket they wore, or more probably from the term *Jacques Bonhomme*, by which the peasants were scornfully designated.

JADE NEPHRITE, a mineral of variable composition, chiefly consisting of silica, magnesia, and lime, used as an ornamental stone, for which it is adapted by its close compact texture and susceptibility of taking an agreeable polish. It is tough, translucent, of about the hardness of quartz, specific gravity 3, and of bluish, light green, or flesh color. It fuses with great difficulty into a white enamel. It is found with the metamorphic slates and limestones.

JAEN, a Spanish province, included in the territorial division of Andalusia, bounded N. by New Castile, S. by Granada, E. by Murcia and Granada, and W. by Cordova; area about 4,500 sq. m.; pop. in 1857, 361,190. Its N. part is entirely filled with the ridges of the Sierra Morena. The central part is an irregular valley, in which several rivers and many streams unite to form the Guadalquivir. The soil is fertile, but little cultivated. The province produces grain, wine, fruits, oil, honey, and various minerals, and abounds in cattle and fine horses; silkworms are bred there. The trade, however, is not extensive.—**JAEN**, the capital of the above province, is a fortified city on the river Jaen, 37 m. from Granada; pop. 18,054. The principal cathedral occupies the site of a Moorish mosque which was demolished in 1492. A new *plaza de toros* was built in 1847. Jaen has been a bishopric since the 13th century, when the Moors were expelled from the city. The place is poor notwithstanding its fertile environs. In 1808 the city was sacked by the French.

JAFFA, or **YAFFA**, the ancient Joppa, a Syrian town in the Turkish eyalet of Damascus, 33 m. from Jerusalem; pop. about 5,000, of whom 1,000 are Christians, 150 Jews, and the rest Turks. It is picturesquely situated on a little rounded hill, dipping on the W. into the waves of the Mediterranean, and surrounded on the land side by orchards; the oranges are the finest of Syria. The town, which looks well from a distance, is a labyrinth of blind alleys and dilapidated lanes and streets. The French steamers to and from Alexandria and Constantinople have called at Jaffa since 1858. The so called harbor consists of a strip of water 40 to 50 feet wide and from 5 to 10 deep, which affords a little shelter to open boats, but is almost useless for commerce. There are several mosques and convents, and the town still retains some of its ancient fortifications. It is now however chiefly celebrated as a landing place of European pilgrims on their way to Jerusalem.—Tradition gives to Jaffa an antediluvian existence. Among the maritime towns allotted to the tribe of Dan we find the name of Japho. It was the port at which the cedar and pine from

Lebanon for the building of the temple of Solomon were landed. Jonah embarked thence for Tarshish. Peter the apostle resided in the house of "Simon the tanner." The town suffered much in the wars of the Maccabees and during the Roman wars, when, having become a receptacle for pirates, it was burned by Cestius and 8,000 of the inhabitants slain. It was an important station during the crusades, and was finally taken by the Mohammedans from the Christians at the end of the 12th century. Taken by Napoleon in 1799, when a large part of the garrison were massacred at his command, the French suffered terribly there from an attack of the plague. Conquered by Mehemet Ali in 1832, it was retaken by the Turks in 1840.

JAGIELLO, or **JAGELLO**, a prince of Lithuania, and founder of a dynasty in Poland called after him, which reigned from 1386 to 1572. (See **LADISLAS II.**, and **POLAND**.)

JAGUAR (*felis onca*, Linn.), the largest of the American carnivora; from its size, strength, and ferocity, it is often called the South American tiger. It inhabits the warmer parts of America from Paraguay as far north as Red river in Louisiana; it is considerably larger than the cougar, and but little inferior to the tiger. There is considerable variation in the size and markings, the height at the shoulder ranging from 2½ to 2½ feet, and the ground color from brownish to ashy yellow; the sides are marked with open circles of black, enclosing a light area with one or more dark spots; these markings, however, vary much in different animals, and even on the two sides of the same animal; there are no distinct stripes, and the lower parts are white; the tail reaches the ground, being shorter than in the leopard and panther. The jaguar lives solitary in thick forests, especially in the neighborhood of large rivers, but is occasionally driven by hunger into the cultivated districts; it is an excellent climber and swimmer, preying upon living animals and fish; its strength is such that it kills and drags off an ox or a horse with ease; its favorite mode of attack is to leap upon the victim's back, and by placing one paw on the head and the other on the muzzle to break the neck by a single effort; it is said to stand in shallow water and throw out fish on the shore with its paws; according to Humboldt it is very fond of turtles, digging up the eggs, devouring the young, and clearing out the flesh of the larger specimens with great skill; it rarely attacks man unless pursued or pressed by hunger, and then is very formidable. Jaguars are now comparatively rare, but Humboldt states in his "Personal Narrative" that 2,000 skins were exported annually from Buenos Ayres alone, in which vicinity their depredations were formerly very extensive; their skins are handsome, and are esteemed for robes. It is occasionally seen in menageries, and, when taken young, is susceptible of partial subjection.

JAHN, **FRIEDRICH LUDWIG**, a German man of letters, politician, and professor of gymnastics, born in Lanz, Brandenburg, Aug. 11, 1778,

died in Freiburg, Baden, Oct. 15, 1852. At the universities of Halle, Göttingen, Jena, &c., he distinguished himself by vast and varied learning. Few surpassed him in the earnestness of his patriotism; it is said that on hearing of the battle of Jena his hair turned white in one night. In 1809 he went to Berlin, where he became teacher in 1810 at the *Kölnisches gymnasium*, and published his *Deutsches Volksthum*, in the style of his friend Fichte's appeal *An die deutsche Nation*. He established gymnasia for physical exercises, where young men were prepared in every way to endure the fatigue of war. These gymnasia spread over Germany. From them is derived the *Turnkunst* or system of physical culture which has of late years become so well known in America. In 1813, during the war, Jahn received from Frederic William III. the command of a battalion of volunteers, with which he entered Paris. After the peace he returned to Berlin, where he delivered a series of lectures distinguished for bold originality, and continued to labor for his gymnasia, which were for a time encouraged by government. But as it was soon found that he still aimed at establishing a united Germany, and that his gymnasia or *Turner* schools were political and liberal clubs, they were all closed in 1819, and Jahn himself was successively imprisoned in Spandau, Küstrin, and Colberg. Liberated after 5 years' confinement, he went to Freiburg, where he became professor, and remained for many years. While there he received an invitation to become professor of German literature at Cambridge, Mass., which he declined, saying that "deer and hares love to live where they are most hunted." In 1848 he was a member of the national assembly at Frankfort-on-the-Main.

JAHN, JOHANN, a German ecclesiastic and orientalist, born in Taswitz, Moravia, June 18, 1750, died in Vienna, Aug. 16, 1816. From his youth he was devoted to the study of the eastern languages. Having removed to Vienna, he was appointed professor of dogmatic theology and of oriental literature in the imperial university of that city. In 1806 he was compelled to resign his professorship on account of his heterodox opinions, and was appointed canon of the metropolitan church of St. Stephen. He was the author of various philological and theological works, the most important of which are his *Chaldean, Arabic, Syrian, and Hebrew grammars*; his *Introductio in Libros Sacros Veteris Testamenti* (translated by Drs. Turner and Whittingham, New York, 1827); and his *Biblische Archäologie* (translated by Prof. Upbam, Andover, 1839).

JAITIQUE, a town of Honduras, situated near the S. extremity of Lake Yojoa, in the department of Santa Barbara; pop. about 2,000. It is celebrated as the place where the last battle was fought between the Spanish and republican forces in the contest for the independence of Central America.

JAKOB, LUDWIG HEINRICH VON, a German writer on philosophy and political economy,

born in Wettin, Feb. 26, 1759, died in Lauchstadt, July 22, 1827. In 1780 he was appointed teacher at the gymnasium in Halle. He was very popular as a lecturer on metaphysics, but after 1800 turned his attention especially to political economy. When the university of Halle was broken up by Napoleon, he went to Kharkov in Russia as professor of political sciences. He distinguished himself as member of a committee appointed to suggest reforms in the finances of the empire, and received various tokens of the regard of Alexander I. He was soon after appointed chief of the revision of the criminal laws, and received a place in the department of finance. In 1816 he returned to Halle as professor of political science. A 4th edition of his *Grundriss der allgemeinen Logik* appeared in 1800; of his *Grundriss der Erfahrungsseelenlehre* in 1810; and a 3d edition of his *Lehrbuch der Nationalökonomie* in 1825. Prof. Jakob was the father of "Talvj," the wife of Prof. Edward Robinson, of New York.

JALAP, the root of the plant first described by Nuttall in the "American Journal of Medical Sciences," Jan. 1830, under the name of *ipomœa Jalapa*, the specific name having reference to the city of Jalapa in Mexico, near which the plant grows wild. In 1827 Dr. John R. Coxe of Philadelphia obtained from Mexico a perfect flowering specimen, and from this the description was made by Nuttall. The Edinburgh college adopted the name *I. purga*, given to the plant by Hayne; but in 1847 Dr. J. H. Balfour showed that it should properly be referred to the genus *exogonium* of Choisy; and the name *E. purga* is adopted by the London and Dublin colleges. The plant belongs to the natural order *convolvulaceæ*, and in its botanical relations and medicinal properties it is closely allied to *convolvulus scammonia*. It is a climbing plant, with annual stems and tuberos perennial roots. The leaves are smooth and heart-shaped, supported upon long footstalks. The flowers are large and of a lilac purple color, 2 and sometimes 3 being supported upon a single peduncle. The corolla is funnel form; the stamens are 5, with oblong, white, somewhat exserted anthers, a peculiarity of the genus *exogonium*. Its habitat is in the elevated districts of the state of Vera Cruz, about 6,000 feet above the level of the sea. The roots furnish the medicine called jalap. When fresh they resemble pears in form and size, are grayish white and fleshy within, and externally brown and covered with a thin epidermis. When dried, if of good quality, they are heavy, solid, hard, and brittle, of deep yellowish gray within, and exhibiting a resinous fracture. The larger roots are marked with incisions made for the purpose of facilitating their drying; and some are divided into slices. These, when of friable texture and white within, are of inferior quality. Some roots are much worm-eaten; but the worms leave untouched the resinous portion in which the active medicinal properties of the root chiefly reside. These roots, on account of their great strength, are preferred in

the preparation of extracts rather than of the powder, in which form the drug is more generally employed. The resin may be separated from the other ingredients by adding water to the alcoholic tincture; it falls as a precipitate, and after being washed with warm water and then redissolved with alcohol may be recovered by evaporation. It may be separated into two sorts, one hard and insoluble in ether, the other soft and soluble. The former, constituting much the largest portion, is the substance called by Meyer rhodeoretine, and by Buchner jalapine. In the dose of 3 or 4 grains it acts as a powerful purge. The proportion in which it is found in jalap varies greatly in different specimens. The most complete analysis of the root is that by Gerber, given in Gmelin's *Handbuch der Chemie*, as follows: hard resin, 7.8; soft resin, 3.2; slightly acid extractive, 17.9; gummy extractive, 14.4; coloring matter, 8.2; uncrystallizable sugar, 1.9; gum with some salts, 15.6; bassorin, 3.2; vegetable albumen, 3.9; starch, 6; water, 4.8; malic acid, and malates of potash and lime, 2.4; chlorides of calcium and potassium, 1.4; phosphates of magnesia and lime, 1.7; carbonate (?) of lime, 3; loss, 4.6; total, 100. The active properties of jalap are taken up in part by water, in part by alcohol, and wholly by diluted alcohol. The alcoholic extract is usually called resin of jalap, and acts as a powerful purgative; the aqueous extract possesses the same quality in a less degree. From its action as a hydragogue the drug is especially adapted to the treatment of dropsy, and is commonly combined, when thus exhibited, with bitartrate of potassa. In the form of a powder and mixed with calomel, it has been a popular prescription in the United States in bilious fever and congestion of the liver, the usual dose being about 10 grains of each, though in the southern states often double this quantity. The exportation of jalap from Vera Cruz is stated to amount to 200,000 lbs. annually. The great demand for the article has led to its being intermixed in Mexico with an inferior root, that of the *ipomœa Orizabensis*, sometimes known as the male jalap, and also as fusiform and as woody jalap. It is further adulterated by the drug grinders by admixture of woody substances; and in England it has been found that guaiacum shavings have been largely employed for this purpose in equal quantities with the true jalap.

JALAPA, or XALAPA, a city of the Mexican confederation, in the state of Vera Cruz, 60 m. W. N. W. from the city of that name; pop. about 10,000. It is built on the side of a mountain at a height of 4,335 feet above the sea, on the road from Vera Cruz to Mexico. It once had a large trade, which has now declined. Its general appearance is pleasing, but the streets are steep and crooked. There is a large Franciscan convent here, and a church said to have been founded by Cortes. In the neighborhood there are one or two cotton factories directed by English and Americans, in which Indian or mestiza girls are employed. Jalap grows wild

around Jalapa, and derives its name from the place. The city enjoys a healthy climate, and is a favorite resort for invalids.

JALISCO, XALISCO, or GUADALAJARA, a state of the Mexican confederation, occupying the middle of the Pacific coast, between lat. $18^{\circ} 45'$ and 24° N. and long. $101^{\circ} 15'$ and $106^{\circ} 15'$ W.; area, 48,591 sq. m.; pop. in 1857, 774,461. It is traversed by the cordillera of Anahuac, and drained by the river Carmichan and the Rio Grande de Santiago. Lake Chapala, which covers an area of about 1,300 sq. m., lies chiefly in this state, on the S. E. frontier. The soil is uniformly fertile, the districts near the coast are covered with luxuriant forests, and but for an unhealthy climate Jalisco would be one of the finest regions of Mexico. Capital, Guadalajara.

JAMAICA (Indian, "isle of springs"), a British West Indian island and colony, lying off the bay of Honduras, between the Caribbean sea and the gulf of Mexico, and between lat. $17^{\circ} 40'$ and $18^{\circ} 30'$ N. and long. $76^{\circ} 10'$ and $78^{\circ} 30'$. It is 80 m. S. from Cuba, 90 m. W. from Hayti, and 500 m. from the isthmus of Panama. Its length from E. to W. is 160 m., its greatest breadth 50 m., and its area about 6,400 sq. m. The population of the island in 1844, when the last census was taken, was 377,433, of whom 15,776 were white, 293,128 black, and 68,529 mulattoes, or, as they are commonly called in the British West Indies, people of color. In 1849 the population was estimated by Gov. Grey at 400,000. Between 1840 and 1856 about 18,000 coolies and other emigrants were brought to the island, while in 1850 and 1851 nearly 40,000 people died of cholera and small pox. The shape of the island is a long oval. Through its length runs a high range called the Blue mountains, intersected by cross ridges. The highest points are Blue Mountain peak, 7,770 feet; Portland Gap ridge, 6,501 feet; Portland gap, 5,640 feet; and St. Catharine's peak, 4,970. According to some authorities, the 3 highest peaks are respectively 8,184, 7,656, and 7,576 feet above the sea. More than 200 streams flow from these mountains to the sea, the largest of which, Black river, is navigable for small craft about 30 m. The other principal streams are Salt river, the Cabarita, the Yallahs, the Cobre, and the Rio Minho on the S. side, the Martha Brae, the White river, Spanish river, Rio Grande, and Wag Water on the N. side. The sea coast of Jamaica is well supplied with harbors, there being nearly 50 which afford tolerable anchorage, while 16 of them are secure against storms from every quarter. The principal ports are Port Morant, Kingston, Old Harbor, Green Island, Montego Bay, St. Ann's Bay, Falmouth, Port Maria, and Port Antonio. The soil is deep and fertile, and is one of the best in the world for the production of sugar, coffee, pimento, and ginger. The principal minerals are argillaceous dark purple schist, gneiss, steatite, serpentine, sienites, white freestone, quartz, limestone, and marble. The principal metal is lead, and more recently copper, silver, zinc, antimony, iron, manganese, and some gold and

coal have been found. The vegetable productions comprise a great variety of forest trees, the most useful of which are the rosewood, satinwood, mahogany, lignum vitæ, lancewood, logwood, ebony, fustic, cedar, pimento, mango, papaw, the palmetto royal, the cocoanut, and several other kinds of palm. Yacca and other furniture woods are very plentiful. The low grounds yield abundantly the sugar cane, cacao, plantain, banana, yam, cassava, okra, ginger, arrowroot, sweet potato, maize, indigo, and tobacco. Coffee is extensively cultivated, and English vegetables are raised on the high lands of the interior. The fruits of temperate climates are not cultivated much, except the grape and apple; but the pineapple, orange, shaddock, pomegranate, fig, granadilla, sapodilla, star-apple, sweet lemon, and many

other fruits grow plentifully in great perfection. Cattle are very numerous, and oxen are much used for draught and for the plough. Mules, hogs, sheep, and goats abound; some of the sheep have long hair instead of wool. All kinds of poultry are abundant, except geese and the common English duck. The only wild animals, beside rats and mice, are the wild hog and the cariacou, a kind of deer. Snakes are numerous, but none are venomous. The land crab and the iguana, a large lizard, are used as food. The seas and rivers swarm with fish, and the alligator is found in the rivers.—The principal occupation of the inhabitants is agriculture, and the commerce of the island depends entirely on the products of the soil. The following official tables are condensed from the "Jamaica Almanac" for 1859:

PRINCIPAL IMPORTS AND EXPORTS OF JAMAICA, FOR THE YEARS ENDING OCT. 10, 1852 TO 1857.

IMPORTS.	1852.	1853.	1854.	1855.	1856.	1857.
Flour.....barrels	97,326	123,810	53,015	56,541	60,051	82,637
Corn meal....." "	17,363	25,418	8,914	9,366	16,206	17,901
Bread and biscuits.....cwt.	6,017½	3,350½	2,886	4,652	2,256½	3,722
Rice....." "	2,347,302	5,309,417	2,293,916	2,393,123	2,678,773	3,556,717
Corn.....bushels	76,566	61,679	40,957	33,059	34,401	29,969
Wheat....." "	7,321	9,733	4,901	12,273	13,725	14,126
Beef.....barrels	2,745	4,113	1,487	2,381	3,592	1,733
Pork....." "	7,172	17,989	7,660	10,257	11,039	7,211
Butter.....firkins	12,303	10,884	11,797	6,605	10,682	7,582
Lard....." "	8,377	8,725	5,708	6,521	5,659	5,571
Salmon, pickled.....barrels	1,034	1,123	770	903	457	693
Smoked herrings.....boxes	3,809	4,531	2,857	5,509	3,214	5,744
Mackerel.....barrels	18,073	6,072	7,135	16,642	13,705	8,530
Herrings....." "	23,174	29,139	22,763	33,123	44,264	29,975
Codfish.....quintals	104,393	87,479	89,512	85,363	70,574	89,901
Brandy.....gallons	34,430	81,255	14,233	11,393	13,176	16,943
Gin....." "	4,804	41,904	3,271	3,223	8,679	15,347
Ale and beer.....tuns	757	612	641	537	693	651
Wines.....tuns	267	325	150	257	127	85
Cheese.....cwt.	1,670½	1,291½	804	1,032	918	904
Refined sugar.....lbs.	94,509	187,602	102,008	33,337	31,989	60,397
Tea....." "	15,364	23,540	5,897	12,591	13,294	10,435
Candles, sperm.....boxes	91	242	33	295	59	35
" composition....." "	3,670	2,423	2,371	3,500	2,311	2,702
" tallow....." "	11,351	11,226	7,096	10,258	9,519	9,511
Soap....." "	37,632	30,436	39,971	50,534	29,042	37,555
Oils.....gallons	116,241	101,940	106,009	107,126	84,156	79,674
Salt.....cwt.	20,925	29,773	30,353	25,653	29,027	53,821
Tobacco, manufactured.....lbs.	192,651	421,158	143,763	237,080	233,735	253,321
" leaf....." "	171,372	701,440	127,465	131,770	156,625	153,321
Bricks.....No.	446,000	290,625	343,970	254,905	400,023	402,061
Coals.....tons	33,716	42,626	24,938	20,779	27,615	26,703
Cattle.....No.	2,655	734	942	151	280	1,054
Sheep and Goats....." "	191	60	39	8	22	39
Red oak staves....." "	623,063	632,293	453,374	696,377	313,363	256,332
White oak staves and heading....." "	783,294	303,099	400,531	485,534	719,250	416,253
Pitch pine lumber.....feet	847,127	1,044,801	821,305	740,657	490,353	650,633
White pine lumber....." "	2,261,466	2,943,445	2,690,542	3,507,424	3,022,026	2,605,556
Cypress shingles.....No.	2,057,849	1,833,850	551,590	1,063,690	1,143,607	1,573,270
Cedar shingles....." "	3,903,553	3,607,300	2,433,300	3,901,635	2,536,110	3,386,460
Wood hoops....." "	753,415	502,095	630,565	493,165	455,730	572,170
Amount of <i>ad valorem</i> duty.....	£6,189 13 11	£4,976 17 10	£17,356 0 7	£44,392 15 9	.....	.....
Tonnage, British.....	96,652	61,534	46,889	59,585	.....	.....
" Foreign.....	56,980	41,016	21,737	29,153	.....	.....
EXPORTS.						
Sugar.....hhds.	31,447	25,752	29,644	25,725	22,846	26,555
"....." "	2,873	3,214	3,738	3,960	4,113	9,573
".....barrels	3,055	3,337	4,739	2,513	3,036	6,846
Rum.....punch.	15,436	10,351	13,397	19,421	14,431	15,933
".....hhds.	294	166	313	834	73	115
".....quarter casks	894	172	103	131	47	25
Coffee.....lbs.	7,127,630	5,037,692	5,990,672	5,657,103	3,323,147	7,093,623
Pimento....." "	5,433,808	4,639,105	5,102,723	7,062,580	6,848,622	8,719,743
Ginger....." "	994,873	575,415	710,086	579,796	343,663	331,167
Arrowroot....." "	196,039	146,182	97,431	87,090	65,523	39,003
Logwood.....tons	4,103	3,754	6,719	10,215	15,524	24,532
Fustic....." "	852	865	293	1,210	1,236	1,104
Lancewood spars.....No.	3,471	3,073	10,939	4,246	4,553	7,570
Mahogany and other woods.....feet	41,724	53,183	90,730	123,670	69,281	115,469
Beeswax.....lbs.	27,423	33,954	64,633	81,536	60,689	112,173
Honey.....gallons	2,253	2,234	7,423	6,487	6,932	13,054
Cocoanuts.....No.	453,662	394,235	415,391	631,909	543,175	741,773
Cotton.....lbs.	18,675	2,966	4,200	280	4,900	.....

A TABULAR RETURN OF THE STAPLE EXPORTS FROM THE ISLAND OF JAMAICA FOR 73 YEARS, ENDING OCT. 10, 1857.

Years.	Sugar.	Rum.	Molasses.	Ginger.	Pimento.	Coffee.	Remarks.
	Hhds.	Punchns.	Casks.	Pounds.	Pounds.	Pounds.	
1772	76,109	....	..	....	....	841,558	
1773	80,788	....	..	....	....	779,303	
1774	75,781	....	..	....	....	739,039	
1775	81,404	....	..	....	....	493,981	
1788	89,340	....	..	....	....	1,035,368	
1789	91,021	....	..	....	....	1,492,282	
1790	91,131	....	..	....	....	1,783,740	
1791	91,020	....	..	....	....	2,299,874	
1793	82,138	35,194	..	1,063,600	1,968,560	3,938,576	
1794	97,124	40,623	..	1,297,100	2,759,080	4,901,549	
1795	95,862	35,421	..	1,996,820	2,626,850	6,315,512	
1796	96,460	41,492	..	2,775,000	1,182,680	7,263,539	
1797	85,109	28,746	..	3,621,260	411,240	7,569,133	
1798	95,158	41,040	..	2,273,880	1,107,900	7,594,306	
1799	110,646	85,013	..	1,353,480	2,570,640	11,745,425	
1800	105,534	37,841	..	632,320	1,640,580	11,116,474	
1801	136,056	49,963	..	84,650	1,806,720	13,401,468	
1802	140,113	46,837	866	260,980	1,041,540	17,961,923	
1803	115,494	44,006	461	419,940	1,941,060	15,866,291	
1804	112,163	42,663	429	769,480	2,603,700	22,063,980	
1805	150,332	53,950	471	412,860	940,680	24,137,393	
1806	146,601	58,780	499	460,660	2,541,000	29,298,036	
1807	135,203	52,811	699	425,320	2,401,230	26,761,188	
1808	132,333	53,507	379	894,400	823,980	25,225,738	
1809	114,630	44,850	230	1,220,140	4,465,200	85,258,663	
1810	112,208	43,335	293	478,720	3,429,240	25,828,565	
1811	138,292	55,098	446	508,640	2,763,720	17,460,068	
1812	118,173	44,111	151	574,900	1,141,000	18,481,986	
1813	104,558	45,604	208	579,860	1,925,640	24,623,572	
1814	109,158	44,598	145	642,160	1,356,240	34,045,885	
1815	127,269	54,321	242	946,540	3,438,240	27,362,742	
1816	103,832	36,416	166	1,311,160	3,518,820	17,289,393	
1817	120,766	48,776	354	1,824,020	2,068,320	14,793,706	
1818	121,758	50,827	407	1,391,040	2,637,900	25,829,456	
1819	116,344	45,333	253	943,160	3,098,760	14,901,983	
1820	122,922	46,933	252	617,420	1,666,740	22,127,444	
1821	119,560	47,870	167	524,520	3,199,560	16,819,761	
1822	94,515	20,403	144	454,140	2,336,460	19,773,912	
1823	101,271	36,244	614	527,700	2,918,640	20,826,445	
1824	106,009	38,760	910	1,121,240	4,104,540	27,677,239	
1825	97,090	28,747	894	2,015,260	2,614,140	21,354,656	
1826	106,712	37,662	549	2,924,040	2,065,920	20,352,886	
1827	87,399	33,570	204	2,464,300	3,785,400	25,741,520	
1828	101,575	38,235	189	2,724,483	3,762,780	22,216,780	
1829	97,893	37,430	66	2,070,660	6,542,900	22,234,640	
1830	100,205	35,025	154	1,748,800	5,560,620	22,256,950	
1831	94,881	36,411	230	1,614,640	3,172,320	14,055,350	
1832	93,686	33,655	799	2,355,560	4,024,800	19,815,010	
1833	85,401	34,976	755	2,811,760	5,423,100	9,666,060	
1834	84,756	32,111	486	2,976,420	3,605,400	17,725,731	
1835	77,970	27,530	300	2,050,840	7,284,660	10,535,015	
1836	67,094	20,536	182	2,020,280	5,654,346	13,446,053	
1837	61,505	21,976	173	2,759,840	5,744,220	8,955,178	
1838	69,613	25,880	149	2,567,641	2,705,640	13,531,795	
1839	49,213	16,072	18	1,669,200	3,812,760	8,897,421	
1840	33,660	11,472	18	1,400,800	3,063,280	7,279,670	
1841	34,491	11,769	51	1,834,120	3,595,380	6,439,370	
1842	50,285	16,566	109	2,008,300	3,753,960	7,043,914	
1843	44,169	15,046	177	1,456,725	3,546,720	7,867,113	
1844	34,444	11,631	92	1,993,600	1,462,440	7,148,775	
1845	47,926	16,997	15	1,588,450	7,181,220	5,021,209	
1846	30,223	14,335	76	1,462,000	2,997,060	6,047,150	
1847	48,554	18,077	22	1,324,480	2,500,140	6,421,122	
1848	42,212	20,194	2	1,320,340	5,231,908	5,684,941	
1849	41,656	16,367	9	1,089,720	7,042,920	3,430,223	
1850	36,090	15,591	9	795,276	4,059,825	127,255	
1851	40,293	18,492	40	1,797,676	4,439,637	5,535,225	
1852	34,414	15,660	11	994,873	5,433,803	7,127,680	
1853	28,813	10,592	..	575,415	4,659,105	6,037,662	
1854	32,730	13,566	2	710,056	5,102,728	5,990,672	
1855	25,717	19,413	..	573,796	7,662,580	5,657,103	
1856	25,970	14,470	..	843,668	6,848,622	3,328,147	
1857	30,459	15,992	..	881,157	8,719,748	7,095,623	

August, revolt in St. Domingo.

Largest ginger crop.

Bourbon cane introduced.

Largest sugar crop.

March 25, abolition of the slave trade.

Storm in October.

Largest coffee crop.

Storm in October, which ravaged Surry.

Storm in October, which ravaged Corn-
[wall.]

Extreme drought this year.

[ry in the West Indies.

Mr. Canning's resolutions relative to slave-

Severe drought this year.

Largest pimento crop.

Emancipation act passed.

Seasons favorable.

" " "

" " "

Entire emancipation, August.

Seasons favorable, but the canes not taken

Drought.

" " "

Seasons favorable.

Drought.

Seasons favorable. Sir Robert Peel's free

Drought.

Favorable.

" " "

Favorable seasons.

Seasons favorable. Suffered from the ef-

Seasons favorable.

" " "

" " "

In 1858 the crops were small, excepting pimento, which was fair, although much below the quantity of 1857. The season of 1859 was unfavorable for all crops, but that of 1860 has every appearance of yielding large crops. The principal banks are the colonial bank and the bank of Jamaica. The total paper circulation of all the banks was, in 1846, £220,498; 1847, £208,-

372; 1848, £172,784; 1849, 130,288; 1850, £145,276; 1851, £139,933; 1852, £125,741; 1853, £122,192; 1854, £175,799. There are 6 savings banks, one of which, the Hanover savings bank, was instituted in 1856. The principal copper mining companies are the Clarendon, consolidated; the Wheel Jamaica; the Ellerslie and Bardowie; and the Rio Grande. The mines

of the latter are situated in the mountains near Port Antonio, in the Golden Vale district, comprising an area of about 5,000 acres. There are also several copper mines successfully worked by private individuals. There are various manufactories, including tanneries and a soap manufactory established about 1853. Jamaica has a steam communication with England twice a month. The steamers leave Southampton on the 2d and 17th of each month, and reach Kingston in about 19 days. They leave again for England on the 27th and 12th. A railway from Kingston to Spanish Town was opened in 1845.—The climate of Jamaica is hot in the lowlands, where the mercury sometimes rises to 100°, and seldom falls to 70°; in the habitable part of the island it has been as low as 42°, while among the mountains, at an elevation of 4,000 or 5,000 feet, the average range is from 55° to 65°. Snow is never seen, though ice is sometimes formed on the highest mountain tops. Thunder storms are very frequent, and sometimes do much damage, especially in the autumn. From July to October is the season of hurricanes. Parts of the island are very unwholesome, being much subject to fever and ague; but to those who live with prudence the climate is considered salubrious, especially in the mountain districts. The yellow fever and the cholera, however, are very destructive, the former coming as an epidemic about once in 7 years.—Jamaica is divided into the 3 counties of Surry, Cornwall, and Middlesex, which are subdivided into 22 parishes. The official capital is Spanish Town or St. Jago de la Vega, a town of 7,000 inhabitants on the river Cobre, about 6 m. from the sea. Kingston, the commercial capital, is an incorporated city with about 32,000 inhabitants. Savannah la Mar, Falmouth, and Montego Bay are the other chief towns. The ecclesiastical establishment of Jamaica consists of a bishop (the Rt. Rev. Reginald Courtenay in 1860), whose diocese includes Honduras and the Bahamas, a coadjutor bishop, 4 archdeacons, 22 rectors, and 50 curates. There are beside 44 Baptist, 22 Methodist, 17 Presbyterian, 16 Moravian, and 10 Independent ministers. The Wesleyan Jamaica mission in 1858-'9 had 67 places of worship; the United Brethren (Moravian), 15; and the Baptists, 78. The United Methodist free churches had 50,000 members. The Roman Catholics have a fine cathedral and 10 churches and chapels, and the Jews 4 synagogues. There are a Roman Catholic, a Hebrew, and various Protestant benevolent societies, and 6 hospitals. The number of prisons in 1856 was 12, and that of prisoners 648. A new general penitentiary and a new lunatic asylum have been since established. Schools are maintained by the religious denominations and by public and private endowment, in which 21,584 children receive education. Among the societies for the promotion of letters and arts are, the St. James's society of arts; the colonial literary and reading society at Kingston, established in 1849; the St. Catharine's literary society at Spanish Town, estab-

lished in 1852; the Jamaica society of arts, established in 1854, and called since 1856 the royal society of arts of Jamaica; the Hanover society of industry, established in 1855; and the Trelawny literary society, established in 1856. The number of daily and weekly newspapers published in the island in 1859 was 9, of which 5 are at Kingston. The principal of these are the "Colonial Standard," the planters' organ, and the "Morning Journal," the government organ, and that of the masses of the people, conducted and owned by blacks.—The government of Jamaica consists of a governor, a privy council, a legislative council, and an elective legislative assembly. The governor (in 1860, Charles Henry Darling) is appointed by the crown, and receives a salary of £5,000, £1,500 being paid by the island, and the remainder by the British government. The privy council is appointed by the governor, and is unlimited in number. The legislative council of 17 members is also appointed for life by the governor; it forms the upper house of the colonial legislature. The lower house, called the assembly, consists of 47 members, being two for each parish and an additional one for the towns of Spanish Town, Kingston, and Port Royal. Members to be eligible must pay £10 taxes annually. The house of assembly is chosen for 7 years, but may be prorogued or dissolved by the governor at any time. In conjunction with the legislative council, and subject to the approval of the governor, the assembly may pass laws for the colony, which, however, must not be at variance with the laws of England. Since 1854 the assembly has been deprived of the right to originate grants of money except through the executive committee, a body of 4 members chosen by the governor and acting in some sort as his ministers. They each receive a salary of £800 and certain allowances. The parishes, which form the principal divisions of the island after the 3 counties, are each presided over by a magistrate appointed for life by the governor, and styled the *custos rotulorum*. Under him is a body called the vestry, consisting of the rector and churchwardens, the justices of the peace, and 10 vestrymen. The judicial system includes a chief justice with a salary of £1,800, and 3 assistant justices with salaries of £1,200 each; they form the supreme court, which holds sittings at Spanish Town 3 times a year, and they also hold circuit courts in the 4 circuits into which the island is divided. Criminal cases are tried by a jury of 12, who must be unanimous to bring in a verdict; in special civil cases a majority of 5 out of 7 is sufficient. The island is garrisoned by a force of 1,400 men, of whom about 800 are blacks of the W. I. regiments; they are paid by the imperial government. A police force is maintained of 447 men, composed almost wholly of blacks and mulattoes. The revenue of the colony, derived from import dues, duties on rum, stamps, stocks, tonnage fees, and a land tax, in the year ending Oct. 10, 1857, was £268,955. The expenditures

in the same year amounted to £252,104. The public debt of the island has increased from £529,856 in 1847 to £913,618 in 1857.—Jamaica was discovered by Columbus, May 3, 1494, during his 2d voyage. It was inhabited by a gentle and peaceful race of Indians, resembling those of Hayti and Cuba; their numbers were estimated at 100,000. In 1509 it was taken possession of by a party of Spaniards commanded by Don Juan d'Esquirel, who treated the natives with unusual humanity during his brief command. His successors did not imitate his example, for it is said that half a century later the native population had entirely disappeared. In 1580, when Portugal was annexed to Spain by Philip II., a considerable colony of Portuguese settled in the island. In 1596 Jamaica was attacked and plundered by an English admiral, Sir Anthony Shirley, in command of a large fleet; he made, however, no attempt to keep possession. For nearly 40 years afterward the island enjoyed peace and became exceedingly prosperous, when in 1635 it was attacked by an English force under Col. Jackson, who defeated the Spaniards in a battle at Passage Fort, ravaged the whole country, and levied heavy contributions. It did not recover from this blow, and was in a distressed and feeble condition, when, May 3, 1655, it was captured by a British expedition under Admirals Penn and Venables, sent out by Oliver Cromwell. Cromwell made great exertions to colonize the island from Scotland and Ireland, and from the North American colonies; but great troubles were occasioned by the mortality among the settlers, and by the constant attacks of the Spaniards and their negroes who had taken refuge in the mountains. These difficulties were at length overcome by the ability and energy of the governor, Col. D'Oyley. A large Spanish expedition from Hayti was totally defeated at Rio Nuevo, May 8, 1658, and the Spaniards finally driven from the island, though their negroes remained in some numbers among the mountains. Shortly after the restoration of the Stuarts a considerable number of colonists came from England. Negroes from Africa began also to be imported in large numbers. About the same time Jamaica became a favorite resort of the buccaneers, and the chief town, Port Royal, grew rich from the profusion with which the pirates squandered there the rich booty they had taken on the seas. In 1670 the island was formally ceded to England by the treaty of Madrid. The buccaneers were suppressed by the exertions of Sir Henry Morgan, who had been one of their most noted leaders, and who became lieutenant-governor of Jamaica in 1675. In 1692 a great earthquake destroyed the rich and flourishing town of Port Royal. In 1694 a powerful French fleet from St. Domingo attacked the island, but, after committing great devastation, was driven off by the militia. In 1722 a hurricane again destroyed Port Royal, which had been rebuilt, but was now abandoned, and its commerce transferred to Kingston. In 1738 a contest which had ex-

isted for nearly 40 years with the maroons or runaway negroes in the mountains was brought to a close by a treaty of peace between them and Gov. Trelawny. In 1760 a revolt broke out among the slaves, which was for a time exceedingly formidable, and was repressed and punished with severity. In 1795 an insurrection of the maroons occasioned much loss of life, and terminated in the transportation of 600 of them to Nova Scotia. In 1807 the introduction of slaves from Africa was prohibited, the number in the island being 323,827. It is computed that the importations from Africa between 1700 and 1786 numbered upward of 600,000. In 1832 great agitation on the subject of slavery pervaded the island, and led to violent acts on the part of the colonists against the missionaries, who were charged with incendiary conduct. The slaves rose in rebellion, and were subdued with difficulty. On May 14, 1833, the English government passed an act abolishing slavery, which however did not fully take effect till Aug. 1, 1838, when all the slaves were emancipated. A compensation for the slaves was granted by the British government to the owners, the total amount of which in Jamaica was £6,161,927. Since that period the history of the island offers no events of interest except parliamentary struggles between the assembly and the legislative council on questions of finance. In 1840 a plan for introducing immigrants into the island for the purpose of augmenting the laboring population was put in operation, the result of which thus far is the accession of about 20,000 coolies and other laborers.—The principal writers who treat of Jamaica are: Bryan Edwards, "History of the British Colonies in the West Indies" (5th ed., 5 vols., London, 1819); John Bigelow, "Jamaica in 1850" (New York, 1851); Anthony Trollope, "The West Indies and the Spanish Main" (London, 1859).

JAMALITICA, a collection of ruins in Honduras, 20. m. N. from the city of Comayagua. They consist of a series of rectangular tumuli faced with stones, and ascended by flights of steps, supporting the remains of what appear to have been ancient edifices. The principal tumulus stands on a broad terrace paved with stones, and is surrounded by smaller mounds regularly placed. The adjacent valley is full of remains, and many vases skilfully wrought and beautifully painted, beside various articles of sculpture well executed, are frequently found when excavations are made.

JAMES I., king of Scotland, and 3d monarch of the Stuart dynasty, born in Dunfermline in 1394, assassinated in Perth, Feb. 21, 1437. He was the son of Robert III. and Annabella Drummond. On the murder of his brother, the duke of Rothesay, he became heir to the crown. His education was intrusted to the bishop of St. Andrew's; but in 1405 it was determined to send him to France, and on his way there the ship that conveyed him was taken by an English man-of-war, and he was made prisoner. He was detained in captivity, chiefly in Windsor castle,

19 years, but both Henry IV. and Henry V. treated him well. The former attended to his education in a liberal manner, learning being then popular with the English nobility; and he attended Henry V. in his French campaigns. In a political sense James's education was the consequence of circumstances, and he could not have passed his youth in a better school for a monarch; but he was detained too long from his kingdom to allow of his abilities and knowledge proving greatly useful to his subjects. He showed poetical powers of no mean order, and his known writings are yet admired. "The King's Quhair," or "Book," was written while he resided in England; and he was too actively engaged as a king after his return to Scotland to devote much time to poetry. Robert III. dying in 1406, his captive son was proclaimed king, and his uncle, the duke of Albany, was made regent, holding the office until his death in 1419. But for Albany's intrigues James would have been sooner restored to his throne. Albany was succeeded by his son Murdoch, who might have transferred the crown to his branch of the Stuart line had he possessed his father's talents and unscrupulousness. The Scotch were then the allies of the French, and Henry V. took James to France in 1419, agreeing to restore him to freedom provided he should prevail upon those of his subjects who were in France to abstain from hostilities; but the Scotch refused to obey a king who was in du-rance. On the death of Henry V. the new government of England resolved to give James his freedom, on condition of his paying £40,000 as the cost of his maintenance in England. He married Joanna Beaufort, granddaughter of John of Gaunt through Catharine Swynford, and niece of Cardinal Beaufort. He reached Edinburgh in the spring of 1424, and immediately commenced that vigorous administration which had become necessary through the bad government of his predecessors. Many important legislative acts were adopted. He persecuted the Lollards, which may be attributed to his Lancastrian education. He proceeded with energy against the fierce nobles, whose lawless conduct demanded punishment. Albany and two of his sons, and the earl of Lennox, were executed; and soon after other executions took place, of the most cruel nature, the victims being merely retainers, who believed they were bound to obey their feudal superiors. The family of Albany was popular, and their deaths made the king unpopular. James I. revived the connection of his kingdom with France, encouraged the clergy as a counterpoise to the nobility, legislated in favor of trade, labored for the restoration of order, provided for the administration of justice, and maintained the dignity of Scotland against the designs of England. An expedition against the islemen proved successful, and 300 robbers were executed. He stripped the earl of March of his earldom and property, which alarmed the nobility. A conspiracy was formed against him, the head of

which was Sir Robert Graham, who was actuated partly by personal and partly by political motives. The talents of Graham placed him at the head of the opposition to the king's measures; but not being well supported by his associates, he was baffled, imprisoned, and banished, and his estates were seized. In the highlands, whither he had fled, he formed his plans. His only associates of eminence were the earl of Athol and his grandson, Sir Robert Stewart, the latter being the king's chamberlain. Through the assistance of Stewart, Graham obtained access to the king's apartments, in the monastery of the Dominicans at Perth, and slew him with his own hands, but not until James had made a heroic resistance, though at last he begged his life of the assassin.

JAMES II., king of Scotland, only son of the preceding and of Joanna Beaufort, born in 1430, killed in 1460. Being but a child when he became king, his mother was appointed to take charge of his person during his minority, and the earl of Douglas lieutenant-general of the kingdom. The government was really in the hands of Sir William Crichton, who had been made chancellor by James I.; and next to him in consequence was Sir Alexander Livingston, another of the late king's statesmen. These two were rivals, and their quarrels added to the troubles of the country. Archibald of Douglas dying, he was succeeded by his son, Earl William, an arrogant youth, who allowed his followers great license; and he and his brother David were put to death by Crichton's orders. The power of Crichton and Livingston was finally ended through the successes of another earl of Douglas in 1446, the king having assumed supreme power in 1444. The internal condition of the country was very bad, through the feuds of the nobles; but Douglas, who was now at the head of affairs, upheld its dignity in the wars with England. A truce for 9 years had been made with England, but in 1448 the English entered Scotland, and were defeated by Douglas, whose brother Ormond soon afterward won the battle of Sark. The truce was then renewed. The power of Douglas was now on the decline. The king, whose intellect early matured, was jealous of him, and, aided by Crichton and by Kennedy, archbishop of St. Andrew's, he asserted his authority with extraordinary vigor, punishing many of the nobles and their adherents. In 1449 James married Mary, daughter of the duke of Gueldres. Douglas made a pilgrimage to Rome, and during his absence the king pursued the measures necessary for the curtailment of his power, but on his return he received marks of royal favor. He soon left the court, and lived as an independent sovereign in his own territories, perpetrating many acts of lawless cruelty, and setting the royal authority at defiance. Too powerful to be encountered openly, Douglas now became the object of conspiracy. A reconciliation was effected between the king and the earl, and the latter visited Stirling castle, where, in spite of

his safe-conduct, he was stabbed by James, and then slain by the royal attendants. In the wars that followed this deed the king triumphed, though not without encountering great resistance, and the main branch of the Douglas family was destroyed. The king sought to improve the condition of the people in various ways, and the legislative measures of his reign were often as liberal as the character of the age would allow. The disputes between the houses of York and Lancaster in England had now openly commenced, and they affected Scotland. In 1459 a treaty was made between James II. and Henry VI., by which the former agreed to support the Lancastrians, to receive in return portions of the north of England, including Durham and Northumberland. James entered England in 1459, at the head of 60,000 men, and his army committed such ravages that Henry prevailed upon him to withdraw. In 1460 he renewed the war, not with England, but with the Yorkists, and laid siege to the frontier fortress of Roxburgh, which the English had held since the defeat of David Bruce at Durham. While the king was examining a battery, one of the guns burst, and a fragment of it struck him in the groin, causing immediate death. This event occasioned great grief, and the soldiers, listening to the appeal of his widow, persevered in the siege, carried Roxburgh by assault, and razed it to the ground.

JAMES III., king of Scotland, son of the preceding and of Mary of Gueldres, born in 1453, murdered in 1488. He was crowned at Kelso monastery, and as his mother was a woman of vigorous capacity, it was hoped that his minority would not prove so disastrous as that of his father had been; but a variety of circumstances overclouded the fair beginning of this reign, and rendered it one of the most unfortunate periods in Scotch history. The triumph of the Yorkists in England was adverse to Scotch interests, as they were identified with those of the house of Lancaster. Henry VI. and his family took refuge in Scotland after the battle of Towton had confirmed Edward IV. in possession of the English crown. Edward showed a desire to be on friendly terms with Scotland, but, partly from interest, and partly from unwillingness to abandon the unfortunate, the Scotch adhered to the Lancastrians. The English king then entered into a treaty with the earl of Ross and the lord of the isles, and the banished Douglasses, by which the conquest and partition of Scotland was resolved upon. Should that country be conquered, all of it to the north of the Forth was to be divided between Douglas, Ross, and the lord of the isles; and Douglas was to receive the old estates of his house in the south. The lord of the isles was to become Edward's vassal. This treaty was made in 1462; but though so formidable in its terms, it led to nothing. Ross alone of the parties to it acted. He called himself king of the Hebrides, and committed some depredations, of which he repented immediately, and then was assassinated. The Scotch nobility

were now divided into two parties, the old lords and the young lords, the former favoring the house of Lancaster, while the other was desirous of peace with England, which implied abandonment of Henry VI. The peace party triumphed, the Scotch covenanting to give no assistance to Henry or his party. The queen mother died in 1463. The family of Boyd now rose to power, and the aristocratical struggles that had so often proved injurious to Scotland were renewed. Bishop Kennedy, the ablest Scotch statesman of that age, and who had long been in the service of the crown, died in 1466. In 1469 James married the princess Margaret of Denmark, and one of the consequences of this alliance was, that the Orkney and Shetland islands became permanent possessions of Scotland. The Boyds fell the same year, and their estates were annexed to the crown. The Hamilton family rose on their ruins. James III. has been represented as a weak and vicious monarch, addicted to favoritism of the worst kind; but such he was not, and his foreign policy and internal legislation show that he had high capacity and sound views. Domestic peace and an alliance with England, the two things most desirable for Scotland, were his aims. For some time after he assumed power he was successful, but the aristocracy, who were warlike and illiterate, hated him for his love of peace and fondness for letters and art. His favorites were artists, the chief of them being Cochrane, an architect, but derisively called a mason. Artisans of all kinds were encouraged. The king's brothers, Albany and Mar, headed the aristocracy, but in the first instance were not hostile to the monarch; but Cochrane, acting upon the king's superstition, caused a breach between him and his brothers. Albany fled to France, and Mar lost his life, but in what manner is not precisely known. Troubles occurred with England, and Albany joined the enemies of his country, who promised to make him king of Scotland, for which he was to render homage. The Scotch aristocracy took advantage of the assemblage of a great feudal army against the English, seizing the king and his favorites, and hanging the latter without trial. Cochrane, who had been made earl of Mar, headed the victims. The king was placed in Edinburgh castle. Albany was reconciled to the king, and became lieutenant-general. The struggle between the king and the aristocracy was repeatedly renewed, the former being often successful, and showing much wisdom in grappling with the evils of the time. The aristocracy, fearful of the final result of the contest, prevailed upon the heir apparent, Prince James, then but 15 years old, to join them. The last contest took place in 1488, when the royal party was defeated at the battle of Sanchie-burn, near Bannockburn, and the king murdered as he fled from the field.

JAMES IV., king of Scotland, son of the preceding and of Margaret of Denmark, born March 17, 1472, slain at the battle of Flodden, Sept. 9, 1513. He was a little over 16 years old when

he began to reign. The coronation took place at Scone, June 26, 1488. His government was one of the most vigorous that Scotland ever knew. Unlike his predecessors, he determined to rule by the aid of the nobility, and not to seek their humiliation. This policy enabled him to rule as well as to reign. Attempts at insurrection were put down. Aided by parliament, the king carried many measures for the improvement of the country, concerning trade and manufactures. When he found his power firmly established he withdrew his favor from the men who had acted with him against his father. Peace was made with England. The encroachments of Rome were restrained. Justice was regularly administered in the lowlands; and the king determined that the highlands should be made subject to law. He made several journeys thither and to the isles, successfully asserting the royal authority. The lord of the isles endeavored to resist, but was stripped of power and possessions. When Perkin Warbeck appeared, claiming to be the 2d son of Edward IV. of England, James supported him, and is believed to have been an original party to the plot that brought him upon the stage. Warbeck visited Scotland in 1495, and was royally received. James gave him a daughter of the earl of Huntly for a wife, the lady being a near relative of his own. He invaded England, but this was injurious to Warbeck's plans, because of the hatred felt by the English for the Scotch. The latter returned home, but the war continued. Henry VII. renewed his offer to give the hand of his daughter Margaret to James, and in 1497 Warbeck left Scotland, when a 7 years' truce was agreed upon. James now proceeded to complete his plans for the improvement of Scotland. Commerce and a navy received much of his attention, and prospered. He again visited the north, and enforced the law in the highlands. Learning was favored by him, and literature flourished. In deference to the views of the nobility, he negotiated a marriage with the princess Margaret of England, and on Aug. 8, 1503, they were wedded. The relations between France and Scotland became very close, which offended Henry VII. Printing was introduced into Scotland in 1507, by Walter Chapman, one of the king's servants. After the accession of Henry VIII. to the English throne troubles between the two countries began, which ended in war in 1513, when James invaded England, and was defeated by the earl of Surrey at Flodden, Sept. 9. The loss of the battle was due to the conduct of the king, who, from exaggerated notions of chivalry, gave up great advantages of position, for which he paid with his life, falling on the field. He showed eminent valor, but no generalship.

JAMES V., king of Scotland, son of the preceding and of Margaret Tudor, born in Linlithgow, April 10, 1512, died in Falkland, Dec. 13, 1542. He was crowned at Scone, and his mother became regent. His minority was a period of great trouble, owing to the weakness of his mother, the rivalry of parties, the venal-

ity and violence of the aristocracy, and the attempts of the English to obtain ascendancy. In his 17th year he escaped from the Douglasses, who then had possession of his person, and became king in fact, giving every indication that he would reign wisely. He showed as much energy as his father had displayed in repressing the troubles on the borders, where he sent several chiefs to the gallows, the famous John Armstrong being one of the number. A rebellion in the Orkneys was promptly quelled; and the chiefs of the Western isles were induced to submit to the king's authority by his firm but conciliatory action. Other measures to promote tranquillity were adopted; but the nobles had become lawless and licentious to an incredible degree during the regency, so that James met with great difficulties in his endeavors to restore peace at home, and some of their leaders were treated with severity, the king's policy being unlike that of his father toward the aristocracy. The clergy were much esteemed by him, and held the principal offices of state, facts of not a little consequence, as the reformation was then going forward, and Scotland was affected by it. The college of justice was established in 1532, supposed to have been modelled on the parliament of Paris, and suggested by the advice of Gavin Dunbar, archbishop of Glasgow, who had been the king's preceptor, and was now chancellor. Its object was to remove the means of oppression from the hands of the nobles. James was courted by foreign powers. Henry VIII. wished him to marry his daughter Mary. Charles V. offered him his sister, the late queen of Hungary, or his niece, a princess of Denmark. Francis I. favored the English alliance, as he and Henry were at that time friends. Border hostilities made it difficult for England and Scotland to be allies. Henry encouraged Scotch rebels, and James aided the disaffected Irish. In 1538, under French mediation, a truce was made, which was converted into a treaty of peace the next year. Henry made James a knight of the garter, Francis conferred upon him the order of St. Michael, and the emperor that of the golden fleece—facts that show his personal importance, and the political weight of his kingdom. Charles made another effort to marry him to one of his nieces, but vainly, though James avowed his attachment to the cause of which the emperor was chief. He persecuted the reformers vindictively, burning some of them, while others were compelled to fly. Henry VIII. urged his nephew to side with him in his contest with Rome, and again offered him the hand of the princess Mary; but he failed, and the pope's attentions and exertions bound James to the papal cause. Paul III. addressed him as "defender of the faith," against which Henry remonstrated. James visited France in 1536, where he married Madeleine, only daughter of Francis I. This lady dying soon after the marriage, James gave his hand to the duchess of Longueville, a daughter of the duke of Guise, who had been sought by Henry VIII. These

marriages caused the king to become still more attached to the party in Europe that was hostile to the reformation, and under the influence of Cardinal Beaton persecution raged with fierceness, while Henry VIII. exerted himself to change the policy of Scotland. In 1540 James led an expedition to the Western isles, which was brilliantly successful. The Hebrides, the Orkney and Shetland isles, and portions of territory in Scotland that had belonged to rebellious barons, were annexed to the crown. The king paid much attention to industrial development, inviting skilful foreign artisans to settle in Scotland. Henry VIII. sought an interview with his nephew in 1541, going for that purpose to York; but James would not visit him. War followed between the two kingdoms, and James made great preparations to meet the English; but his feudal array could not be relied upon, the nobility being thoroughly discontented. At Fala Muir and Solway Moss they openly defied his commands, and would not resist the enemy. James fell into despair, and died in a few days. When the birth of his daughter Mary was announced to him, he said: "It [the crown] came with a lass, and it will go with a lass." These were among his last words.

JAMES VI. of Scotland, and I. of England, son of Henry, Lord Darnley, and Mary, queen of Scots, born in Edinburgh castle, June 19, 1566, died in the palace of Theobalds, March 27, 1625. His reign agrees nearly with his life, dating from July 29, 1567, when his mother, queen regnant of Scotland, was dethroned, and power passed finally into the hands of the Protestant party. He resided at Stirling castle, under the guardianship of the earl of Mar, and his preceptor was the learned George Buchanan, who, on being reproached with having made the king a pedant, declared that it was the best he could make of him. During his minority the contest between kingsmen and queensmen was bitterly waged, and the earls of Murray, Lennox, Mar, and Morton were successively regents. In 1577, on the overthrow of Morton, James assumed power, and the next year this assumption was confirmed by parliament. He early exhibited that fondness for masculine favorites of distinguished personal beauty, which has left a cloud on his fame. He was seized by some of the nobility in 1582, but recovered his liberty and power, and banished his enemies. The latter returned in 1585, and forced the king to capitulate. He formed an alliance with Elizabeth in behalf of Protestantism, then threatened by the great Catholic powers, and wrote a work to prove that the pope was Antichrist. He sought, but ineffectually, to save his mother's life, when she had been sentenced to die in England. He adhered to England in the year of the armada, knowing that Philip II. would not conquer it for him. He made a voyage to Denmark in 1589, and married Anne, 2d daughter of Frederic II. His reign was much disturbed by internal troubles of various kinds, caused by the nobles, the clergy, and the citizens of Edinburgh. His

Basilicon Doron, intended for the instruction of his son Henry, was published in 1599. He endeavored to restore Episcopacy, but with no success. His exertions to make sure of the English crown were more zealous than wise. On the death of Elizabeth, March 24, 1603, he was proclaimed king of England by the queen's council, in violation of the will of Henry VIII. He left Edinburgh April 5, and journeyed to London, his clumsy person and gross manners making a most unfavorable impression on his new subjects, who soon found that he was unworthy of their respect. Cecil monopolized power. Raleigh was tried and condemned for treason, and was kept for 13 years in prison. A disgraceful peace was made with Spain in 1604. Arbitrary sentiments prevailed at court, and the king had trouble with his parliaments. The gunpowder plot, in 1605, was caused by the disappointment of certain Catholics, whom he had encouraged to hope for the mitigation of the penal laws under which they suffered. In 1612 two heretics were burned at Smithfield, the last executions of the kind perpetrated in England. The prince of Wales died in 1612, under suspicious circumstances. The princess Elizabeth, the ancestress of the present English dynasty, was married to the elector palatine, Feb. 14, 1613. The "grand oyer of poisoning" took place in 1616, ending in the disgrace of the earl of Somerset, who had been a royal favorite, though now superseded by George Villiers, first duke of Buckingham of that name. Raleigh was released, and allowed to make his voyage to Guiana, and was put to death on his return, to gratify the Spanish government. James's foreign policy was as base as it could be, and the English felt the disgrace all the more sensibly because of the contrast it made with the glory of Elizabeth. When the 30 years' war broke out, though it involved the fate of his daughter and son-in-law, and they failed to get what they sought, lost their own dominions, and became exiles and beggars, he would do nothing for them. This was fortunate for England, to which the cowardice of James proved as wholesome as had the cowardice of John. Had he entered into the war, he might have established a despotism in his dominions, by the aid of an army. A leading object with him was to conciliate Spain, and obtain the hand of a Spanish princess for his eldest son. Other means having failed, Buckingham, who now ruled both king and prince, persuaded Charles to go to Spain, to urge his suit for the infanta. This journey was made, but led only to disappointment, Buckingham taking offence, and, as it is said, causing the marriage to be broken off. Bacon, who was lord chancellor and a peer, was disgraced in 1621, because of his corrupt acts. War was declared against Spain in 1624, and parliament was dissolved the same year. The hand of the princess Henrietta Maria, daughter of Henry IV. of France, was now sought for Charles, and it was contemplated to form an alliance with that country

against the house of Austria. A small force was sent to the continent, to help the Protestant cause, and this was followed by a larger one; but the first accomplished nothing, and of the second one half the men perished on board the vessels in which they embarked, France and Holland not allowing them to land. Buckingham's favor with the king was now lost, but he had great influence over the prince of Wales; and the king falling sick, the duke and his mother were suspected of having poisoned him. His death was really caused by a tertian ague, acting on a constitution undermined by intemperance, chagrin, and mortification. The most remarkable event of James's reign was the authorized translation of the Bible into English, which was his work, as it was not only done under his patronage and by his direction, but the corps of translators were governed by excellent rules of his framing. The version thus effected has maintained its ground, and promises long to find favor with the English race. James was a man of much learning, but his scholarship was deformed by the most offensive pedantry, as his writings were by the grossest superstition, witches being the especial objects of his fear, hatred, and persecution, though he is said to have become more reasonable on the subject in his latter days.

JAMES II. of England, and VII. of Scotland, second surviving son of Charles I. and Henrietta Maria, born at the palace of St. James, Oct. 15, 1633, died at St. Germain, Sept. 16, 1701. He was called duke of York at once, but not by patent until 1643. He was but 8 years old when the civil war broke out, and was an eye-witness of the battle of Edgehill, the first grand affair of the contest, where he came near losing his life. He was present at the siege of Bristol in 1643. When Oxford was captured in 1646, James became prisoner to Fairfax. At a ceremonious visit of the chiefs of the parliamentary army, Cromwell was the only man who knelt to the prince. He was well treated by his captors, and allowed frequent interviews with his father, living most of the time in company with his brother Gloucester and sister Elizabeth, at St. James's, under the guardianship of the earl of Northumberland. He escaped in 1648, and fled to Holland, whence, and after a residence in Flanders, he went to Paris in 1649. The same year he accompanied his brother Charles to the island of Jersey, residing there 4 months. Returning to the continent, he visited Brussels, Rhenen, the Hague, and Breda. After the triumph of the enemies of the Stuarts in 1651, he entered the French service, distinguishing himself under Turenne and Condé; both those eminent generals bore testimony to his soldierlyship and courage. When, in 1655, the relations between England and France became close, James was forced to leave France, and he entered the Spanish army, where he fought against the English and French. He was treated with much consideration by the Spaniards. He shared in the benefits of the restoration of his family to

the British throne in 1660; and on Sept. 3 of that year was married to Anne Hyde, daughter of the earl of Clarendon, to whom he had contracted himself the preceding November. This lady dying in 1671, James two years later married Maria Beatrice Eleonora, a princess of the ancient house of Este of Modena, his junior by 25 years. He became a Catholic while in exile, but did not avow his religion until some years after the restoration (1671). In the wars with Holland he distinguished himself in command of the English fleet, and always showed capacity for naval affairs. The passage of the test act in 1673 caused him to throw up all his employments. He incurred great danger during the time of the popish plot, and when the parliamentary test was adopted in 1678, it was with difficulty that he maintained an exceptional privilege to retain his seat in the house of peers. It was sought to exclude him from the succession, and Shaftesbury endeavored to prevail upon the grand jury of Middlesex to indict him. The commons passed the exclusion bill, but it was rejected by the peers; it had passed the commons in the preceding parliament, but through a dissolution failed to reach the upper house. James retired to Brussels in 1679, but returned when the king was attacked by illness. He was sent to Scotland, as head of the administration there, and treated the Covenanters with singular cruelty. The Oxford parliament, which would have passed the exclusion bill, was dissolved at the commencement of 1681. A reaction had now commenced, favorable to James's fortunes. He returned to England in 1681, and had much influence at the court and in the country, and he upheld all those severe measures by which the tory party sought to exterminate the whigs. When Charles II. died, Feb. 6, 1685, James succeeded him, not only without difficulty, but as a popular sovereign. His conduct was most arbitrary from the beginning; and the parliament he called was the most servile of any body of the kind mentioned in English history. Argyle's invasion of Scotland, and Monmouth's invasion of England, were subdued with little difficulty, and were followed by unparalleled punishments inflicted on the rebels. He soon broke with his obsequious parliament, as he required the repeal of the test and habeas corpus acts, which were as dear to the tories as to all others of his subjects except the Catholics. He prorogued the parliament from time to time, and ultimately it was dissolved. He set himself systematically to work to effect two ends, viz.: the overthrow of the constitutional system of England, and the restoration of the Catholic religion to the position it had held there in the early part of the reign of Henry VIII. At first he thought he could best succeed by employing the established church against the dissenters; but finding the Episcopalians would not give him their aid, he sought to gain the dissenters. A great number of measures were adopted of an illegal character. A new court of ecclesiastical

commission was erected; a great standing army was created; the privileges of the universities were violated; the test act became a dead letter; corporations were modelled and remodelled, in the hope that a parliament might be packed that should so act as to give to the king's doings the forms of law. In less than 3 years the king had arrayed all his subjects against him, except the Catholics and a few of the dissenters, the great majority of the dissenting interest siding with the established church, and whigs and tories coalescing. All offices were in the hands of the Catholics, or of Protestants who were ready to do the work of Catholics. The foreign policy of the country was made subservient to that of France, because the support of that country was necessary for the success of James's home policy. The pope and the governments of Spain and Germany were hostile to James's course, because they were alarmed at the encroachments of Louis XIV. Matters were brought to a crisis in June, 1688, by the opposition which the declaration of indulgence encountered. The archbishop of Canterbury and 6 bishops were sent to the tower, and tried on the charge of libel, for petitioning the king against the order that the declaration should be read in the churches. They were acquitted, but the excitement was without a parallel even in English history of that century. On June 10, Queen Mary gave birth to a son, who was afterward known as the pretender, the popular opinion being that the queen's pregnancy was a sham, and that the child was spurious, which libel on James was long believed by most Englishmen. This event hastened the revolution. Men had been restrained from action by the belief that, as James had no children, the throne must, in course of nature, soon pass to his eldest daughter, Mary, wife of William, prince of Orange, who was a Protestant; but the birth of his son dispelled their hopes, and on June 30, 1688, William was invited to invade England, the invitation being signed by the earls of Shrewsbury, Devonshire, and Danby, Lord Lumley, Henry Sidney, Edward Russell, and Henry Compton, the suspended bishop of London. Though James was warned of what was going on, both by Louis XIV. and by others, he would believe nothing adverse to his wishes, and was taken entirely by surprise when William sailed from Holland, with an army of 15,000 men. The invaders landed at Torbay, Nov. 5, and James was soon abandoned by nearly every one, including his daughter Anne. He fled from England, having previously sent away his wife and son, but was detained, and returned to London, much to the regret of his enemies. Every facility for flight being placed in his way, he fled a second time, and reached France. He was magnificently received by Louis XIV., who assigned him a large pension, and the palace of St. Germain as a residence. He went to Ireland in 1689, in which country the native population were attached to his cause. He underwent many humiliations in Ireland, and was

defeated at the battle of the Boyne, July 1, 1690, where he exhibited little of that courage which he had displayed in earlier life. Returning to France, he resided there until his death, passing his time between devotion and plotting, and countenancing schemes for the assassination of William III. The battle of La Hogue, in 1692, proved fatal to his hope of a successful descent on England, though the idea of such descent was not abandoned by the exiles themselves. He was offered the candidature for the crown of Poland in 1696, but would not accept it. The treaty of Ryswick in 1697, by giving peace to France and England, removed all prospect of restoration; but the ex-king and his family continued to be the guests of Louis XIV. His health declined, and on Sept. 2, 1701, he was struck with apoplexy, and died in two weeks.

JAMES FRANCIS EDWARD STUART, son of the preceding, called the chevalier of St. George, a pretender to the throne of England, born in London, June 10, 1688, died in Rome, Jan. 2, 1766. His legitimacy was suspected even before his birth, the nation believing that his mother, Queen Mary of Modena, was not really pregnant, but that it was intended to introduce a pretended Roman Catholic heir by some sleight of hand. Though this charge has been fully disproved, it was one of the reasons why the infant prince of Wales was not proclaimed king immediately after the abdication of his father in 1688. His childhood was passed at St. Germain, where Louis XIV. gave an asylum to the exiled royal family. It was rumored at the time, and has been often repeated, though there is no evidence of it, that by a secret article of the treaty of Ryswick (1697) it was stipulated that the prince of Wales should succeed to the English throne on the death of William III. His father died, Sept. 16, 1701, and he was immediately acknowledged king of Great Britain by Louis XIV. under the title of James III. He was recognized as such also by the king of Spain, the pope, and the duke of Savoy. No active measures, however, were taken in his behalf, till in March, 1707, he sailed from Dunkirk with a French fleet for the invasion of Scotland. The expedition returned without even having effected a landing, and the baffled prince now assumed the name of the chevalier of St. George and joined the French army in Flanders. He was present at the battle of Oudenarde, July 11, 1708; and in that of Malplaquet, Sept. 11, 1709, he charged the English at the head of the French cavalry. Meantime the English parliament set a price of 100,000 crowns upon his head. In 1713 he was secretly favored by Bolingbroke and other ministers of Anne, and the queen herself regarded him with predilection; but he rejected their urgent advice to renounce, or at least to pretend to renounce, the Roman Catholic faith. The sudden death of Anne arrested the designs of Bolingbroke and the Jacobites; and Bishop Atterbury, who vainly offered to head a procession in his lawn sleeves for proclaiming James at Charing cross, is said to have

exclaimed with indignation: "There is the best cause in Europe lost for want of a little spirit." The chevalier hastened to the court of Versailles, but found it fearful of allowing England any pretext for rupture, was ordered to leave France, and retired to Plombières, where he issued a manifesto which was published in England, asserting his right to the crown. At Commercy in Lorraine he was joined by Bolingbroke, who sought in his interest to incite the French government to war with England. This was prevented by the death of Louis XIV., and the hopes of the chevalier were languishing when, on Aug. 27, 1715, the earl of Mar invited the principal Jacobite gentlemen of Scotland to a great hunting match, took with them the oath of fidelity to James III., and raised the standard of rebellion in the highlands. In this year, according to Jesse, parliament offered £100,000 for James's head. Encouraged by vessels from France with arms and officers, Mar was soon at the head of 10,000 well equipped men, made himself master of the whole province of Fife, and marched to Dunblane. He at first fell back before the duke of Argyle, commander-in-chief of the English forces in Scotland, but being reinforced fought with him the doubtful battle of Dunblane (Nov. 13, 1715). On the same day in England the Jacobites were obliged to surrender Preston, with many prisoners, and news was received that Lord Lovat had delivered up the castle of Inverness, though hitherto professing to act in the interest of the chevalier. The clans soon began to forsake the standard of Mar, whose army dwindled to half its original number. Though the chevalier had been proclaimed in numerous places in England and Scotland, his partisans had gained no formidable successes. While his cause bore this gloomy aspect, he himself arrived at Peterhead, Dec. 22, 1715, passed incognito through Aberdeen, received Mar most cordially at Fetteresso, made his public entry into Dundee, and continued his progress to the royal palace of Seone. Though everywhere received with acclamation, he was disappointed to find, instead of a large and victorious army, only a discordant multitude, without money, arms, or ammunition. He had not the energy and courage to struggle with the difficulties of his position. The resolution to retreat was taken at a council on Jan. 29, and at Montrose he reëmbarked for the continent in a way that gave his departure every appearance of desertion and deceit. It has been claimed, however, that he wished to share the fate of his unfortunate followers, but, the enterprise having become desperate, yielded only to the argument that they would obtain better terms from the government in his absence than if he remained. After a voyage of 7 days he landed at Gravelines, whence he proceeded to St. Germain, where he was immediately visited by Bolingbroke, whom he soon deprived of the empty honor of being his secretary of state, which office was transferred to the earl of Mar. The triple alliance (1717) obliged him

to leave France, and in the following year he was received with regal honors at Madrid, and was one of the pretexts for Alberoni's preparations for an invasion of England. In 1719 he married the princess Sobieski of Poland; and in 1720 his eldest son, Charles Edward, the hero of the enterprise of 1745, was born at Rome. In 1722 he issued from Lucca a strange manifesto, proposing that if George would deliver to him the throne of his fathers, he would in return bestow upon George the title of king in his native dominions and invite all other states to confirm it. In 1725 his wife, with whom he had lived unhappily, retired to a convent, and during his latter years he led a quiet and pious life in Rome.—See J. H. Jesse, "Memoirs of the Pretenders and their Adherents," in Bohn's "Historical Library."

JAMES, GEORGE PAYNE RAINFORD, an English novelist, born in London in 1801. He was educated at Greenwich in a school kept by a French emigrant, and at the age of 15 was sent to France, where he passed several years. While a boy he manifested decided literary tastes, and was in the habit of writing small pieces in prose and verse for the amusement of himself and his friends. He also became an anonymous contributor to the magazines. Some of his productions having come under the notice of Washington Irving, James was urged by him to attempt a work of more importance. Thus encouraged, he produced in 1822 a life of Edward the Black Prince, the first book bearing his name. Previous to this, when but 17 years old, he wrote a collection of eastern stories, which were published under the title of the "String of Pearls" in 1832. His first essay as a novelist, "Richelieu," written in 1825, but not published until 1829, showed the influence of Scott's historical romances, a species of fiction which he thenceforth cultivated almost exclusively. It met with considerable success, and encouraged the author to pursue a literary career, a course which indeed was rendered necessary by the death of the earl of Liverpool, a friend of his father, and on whom his own prospects greatly depended. "Richelieu" was followed by "Darnley" and "De L'Orme" (1830), "Philip Augustus" (1831), "Henry Masterton" (1832), "Mary of Burgundy" (1834), and a long list of other romances coming down to the present time, in the composition of which the author has generally drawn his principal scenes and incidents from history, although he has given them a coloring not always in accordance with historical truth, however well adapted to his purpose. In spite of a monotony of tone and a repetition of incident, his works have been widely read in England and the United States, and the earlier ones are regarded as standard novels. The list of original works of all descriptions published under his name amounts at present to nearly 80, in over 190 volumes, the last being "The Cavalier" (1859); an instance of literary fecundity perhaps without a parallel in any other author who has written the English language. It is

said that his method of composition is by dictation to an amanuensis. Among his works are several volumes of poetry, and many of history and biography, including the "History of Chivalry," and lives of Charlemagne, Richard Cœur de Lion, Henry IV. of France, and Louis XIV., written in a popular style. In addition to these he has edited a variety of miscellaneous works, and has published enough stories and articles in periodicals to fill 8 or 10 more volumes. In 1852 he wrote in conjunction with Mr. Maunsell B. Field, of New York, a novel entitled "Adrian, or the Clouds of the Mind." For a very brief period he held the position of historiographer of England by the appointment of William IV. About 1850 he removed to the United States with his family, fixing his residence in Stockbridge, Berkshire co., Mass. In 1852 he was appointed British consul in Norfolk, Va., where he remained until his appointment in 1858 to be consul at Venice, in which city he is now (1860) living. Among the novels suggested by his experiences of American life and history are "Ticonderoga" (1854) and "The Old Dominion" (1856). A collected edition of his works, commencing in 1844, has been published in London, and of nearly all his novels cheap reprints have appeared in the United States. The greater part of them have been translated into German.

JAMES, HENRY, an American author, born in Albany, N. Y., June 3, 1811. The accidental burning of one leg, while at play when he was 12 years old, resulting in amputation after 4 years of suffering, interfered with the regular course of his education. He spent one year at Union college, however, and another in the study of theology at Princeton, but never applied for license to preach, because of a conviction that the gospel which as a minister of any of the regular churches he would be bound to set forth, was not in accordance with apostolic standards. During a tour in Europe he became interested in the views of Robert Sandeman, of whose "Letters on Theron and Aspasio" he prepared an edition with an original preface (New York, 1839). In 1840 he published a pamphlet entitled "Remarks on the Apostolic Gospel," in which he maintained the absolute divinity of Jésus Christ, while denying the doctrine of the Trinity. On another visit to Europe in 1843 he became acquainted with the works of Swedenborg, which have ever since exercised a great influence upon his opinions and writings. In 1846 he published "What is the State?" a lecture delivered in Albany; and in 1847, "A Letter to a Swedenborgian," in which, while asserting the doctrine of Swedenborg, he argued against the ecclesiastical organization of the New Jerusalem church. In the winter of 1849-'50 he delivered in New York a course of lectures, which were collected into a volume under the title of "Moralism and Christianity" (1852), and excited much attention. The leading idea of this volume is the distinction between the moral and the religious life of man; the former being, according to the author,

mere obedience to the law of human society, while the latter is the product of divine love and light flowing into the soul; consequently the one is outward, formal, and temporary, while the other is inward, spontaneous, and permanent. A second course of lectures delivered in 1851-'2, setting forth the same general views, was published, together with several articles written for magazines and reviews, in a volume entitled "Lectures and Miscellanies," in 1852. This was followed by "The Church of Christ not an Ecclesiasticism" (1854), "The Nature of Evil" (1855), and "Christianity the Logic of Creation" (London and New York, 1857). In all these works Mr. James advocates, with exceeding beauty of style and fervor of argument, a body of religious, philosophical, and social doctrine, which in its theological affinities is most related to Swedenborg, and whose humanitarian tendencies accord with the teachings of the modern socialists. Mr. James is, however, rather a theologian than a metaphysician; the absoluteness of the Divine Being, and the divine humanity of the Saviour, forming the starting point of all his speculations.

JAMES, JOHN ANGELL, an English Congregational clergyman and author, born in Blandford, June 6, 1785, died in Birmingham, Oct. 1, 1859. He was in early life apprenticed to a draper, but was subsequently placed in the dissenting college at Gosport to be educated for the ministry. In 1804, while still a student at the college, he temporarily supplied the pulpit of Carr's lane chapel, Birmingham, then vacant, with such satisfaction to the congregation, that he was unanimously requested to become their pastor. At the expiration of a year he finished his education, and returning to Birmingham was in May, 1805, ordained to the office of pastor over the congregation, a position which he occupied uninterruptedly until the close of his life. In a few years the congregation, which at the time of his ordination had numbered less than 200, was increased to several thousands; and in the course of his long ministry it became one of the most flourishing in the United Kingdom. The 50th anniversary of his ordination was celebrated by a remarkable jubilee. As an able and voluminous author Mr. James was widely known among the evangelical Protestant denominations in England and America. Soon after he was ordained he issued the "Sunday School Teacher's Guide," of which the 17th edition appeared in 1845; and almost to the close of his life volumes, tracts, addresses, and sermons followed each other in rapid succession. A series of his works, including "The Anxious Inquirer," "The Church Member's Guide," "The Christian Father's Present to his Children," and "The Christian Professor addressed in a Series of Counsels," have been circulated by hundreds of thousands of copies, and translated into 10 or 12 languages. Among his numerous other writings may be mentioned "The Course of Faith," "Christian Hope," "The Family Monitor," "The Church in Earnest,"

&c. He possessed the love and respect of persons of all denominations, and his funeral was said to have been the largest ever known in Birmingham.—See “John Angell James: a Review of his History, Character, Eloquence, and Literary Labors,” by John Campbell, D.D. (8vo., London, 1860).

JAMES, ROBERT, an English physician, born in Kinverston, Staffordshire, in 1703, died in 1776. He was educated at St. John's college, Oxford, subsequently studied medicine, and after practising in Sheffield, Lichfield, and Birmingham, removed to London, where he probably passed the remainder of his life. He is principally known as the inventor of the fever powder, called “James's powder,” which, notwithstanding the opposition of the faculty, came into nearly universal use, and was a source of great profit to himself and his family. He is the author of “A Medicinal Dictionary” (3 vols. fol., London, 1743-'5), in the preparation of which he was assisted by Dr. Samuel Johnson; of a posthumous publication entitled “Vindication of the Fever Powder;” and of treatises on the practice of physic, canine madness, &c. The preparation of his powder was kept secret for many years, but it is now known to be composed of oxide of antimony and phosphate of lime, and is called antimonial powder.

JAMES, SAINT. I. Surnamed the Elder, son of the fisherman Zebedee and Salome, brother of the evangelist John, one of the 12 apostles, died about A. D. 44. With his brother John, he followed his father's occupation, and they seem to have been acquainted with Jesus, and to have recognized him as the Messiah, some time before their call to attend him constantly. It was probably their zeal and boldness that gained them the appellation of Boanerges, or sons of thunder. They witnessed the transfiguration, the restoration to life of Jairus's daughter, the agony in the garden of Gethsemane, and the ascension. James preached as an apostle chiefly in the vicinity of Jerusalem. Under Herod Agrippa he suffered martyrdom by the sword, and, according to Clement of Alexandria, his accuser was so much affected by the boldness of his confession of faith that he at once professed himself a Christian, and was beheaded immediately after him. There is a tradition that he went to Spain, of which country he is the patron saint, and St. Jago di Compostella claims the possession of his bones. The Gospel of St. James which was discovered on a mountain in Granada, written upon lead, in 1595, was declared by Pope Innocent XI. in 1682 to be spurious. II. Surnamed the Less, son of Cleophas (or Alpheus) and Mary, a sister of the Virgin Mary, one of the 12 apostles, died about A. D. 62. He was the cousin of Jesus, and was sometimes called his brother. The son of Alpheus and the brother of the Lord are supposed by some critics to be two persons, and Neander pronounces the question the most difficult in the apostolic history. According to Clement of Alexandria, he was a priest and a Naza-

rite before he was an apostle. After the ascension he was appointed bishop of Jerusalem, and there, in the first apostolic council, he spoke against those who wished to make the law of Moses binding upon Christians. The progress of Christianity under him alarmed the Jews, and Ananias, a son of the high priest Annas, undertook and accomplished his death. The apocryphal “Gospel according to the Hebrews” states that he was first precipitated from a pinnacle of the temple, and afterward stoned. He was noted for the purity and holiness of his life, and held in the highest esteem by the Jews. —The EPISTLE OF JAMES, one of the books of the New Testament canon, has been ascribed to James the son of Zebedee, to a pseudo-James who assumed the name to gain authority, to James the son of Alpheus, and to James the brother of the Lord. It is most commonly attributed to the last, with whom the son of Alpheus is regarded by most critics as identical. It was probably written just before the martyrdom of the apostle (62), and was addressed to the Jewish Christians of Asia Minor. In his doctrine, James lays the greatest stress upon the necessity of works, in distinction from Paul and John, respectively the preachers of faith and of love. The style of the epistle is highly eloquent and poetical.

JAMES CITY, a S. E. co. of Va., bounded N. E. by York river, S. by James river, and W. by the Chickahominy; area, 184 sq. m.; pop. in 1850, 4,020, of whom 1,868 were slaves. It has a rolling surface, well timbered with oak and pine. The productions in 1850 were 102,430 bushels of Indian corn, 25,476 of wheat, 22,040 of oats, and 17,785 lbs. of butter. There were 2 grist mills, 9 churches, and 165 pupils attending public schools. Capital, Williamsburg.

JAMES RIVER, the largest stream which has its whole course in the state of Virginia. It is formed near the centre of the state, on the border of Alleghany and Botetourt cos., by the union of Jackson and Cowpasture rivers, and thence flows S. E. and E. to the Blue Ridge, at the foot of which it receives Calfpasture river on the left. Breaking through the Blue Ridge about 15 m. N. from the Peaks of Otter, it resumes its S. E. course to Lynchburg, near which town it bends sharply to the N. E. On reaching the boundary between Albemarle and Buckingham cos., it takes an E. S. E. direction, which it retains with little variation until it reaches Richmond, where it turns nearly S. It is here obstructed by rapids, and embraces a number of small islands. Near the S. E. extremity of Henrico co. it again takes a S. E. course, after some tortuous deviations, and finally flows into the S. part of Chesapeake bay, through a broad estuary, at the mouth of which are Hampton roads. Willoughby point and Old Point Comfort are on either side of its embouchure. The river is 450 m. long, and navigable by vessels of 130 tons to Richmond, at the head of tide water, 150 m. from the sea, whence the James river and Kanawha canal, completed beyond the Blue Ridge and designed to extend to Coving-

ton on Jackson's river, passes along its upper course. The principal tributaries of James river are the Appomattox on the right and the Chickahominy on the left. The most important towns on its banks are Richmond, Lynchburg, Scottsville, Manchester, and Buchanan.

JAMESON, ANNA, a British authoress, born in Dublin, May 19, 1797. Her father, Mr. Murphy, an artist of merit, and of reputation in the early part of the present century, was painter in ordinary to the princess Charlotte, and from his conversation and example she derived her enthusiasm for art and intimate acquaintance with its technicalities. At the age of 27 she was married to Mr. Jameson, a barrister, who soon after received a government appointment in Canada. The marriage proved unhappy, and was soon practically if not legally dissolved. After her separation from her husband, she made a tour through France, Italy, and Germany, and in 1826 published anonymously her "Diary of an Ennuyée," a work recording her experiences of travel. Its genial descriptions and criticisms, and the skilful blending of these with a thread of romance, made the book popular, and many subsequent editions have appeared. She published in 1829 "Loves of the Poets" (2 vols. 8vo.), a series of sketches showing the influence which women have exercised on poetic minds; in 1831, "Lives of Celebrated Female Sovereigns" (2 vols. 8vo.); and in 1832, "Characteristics of Women" (2 vols. 8vo.), containing disquisitions on the female characters in Shakespeare's plays, an important contribution to Shakespearean literature. Of this book, as of the "Loves of the Poets," American editions have appeared. Her next work, "Beauties of the Court of Charles II.," consisting of letter-press illustrations of engravings from copies of the original pictures by Sir Peter Lely, made by her father at the desire of the princess Charlotte, affords an example of a judicious and graceful treatment of a difficult subject, and is as widely known as any thing she has written. It was followed by "Visits and Sketches at Home and Abroad," a collection of miscellanies, including a new edition of her "Diary of an Ennuyée." She subsequently visited Canada and a portion of the United States, recording her experiences in "Winter Studies and Summer Rambles in Canada" (3 vols. 8vo., 1838), and in 1840 published a translation entitled "Pictures of the Social Life of Germany" (2 vols. 8vo.), as represented in the dramas of her friend the princess Amalia of Saxony. In 1840 the series of works on art, by the publication of which she has gained her chief literary honors, properly commences with a translation of a work on the life and genius of Rubens by Dr. Waagen. It was followed by a "Handbook to the Public Galleries of Art in and near London" (2 vols. 8vo., 1842), and a "Companion to the Private Galleries of Art in London" (8vo., 1844), both highly commended as well for the valuable information they convey as for the attractive style in which they are written. In 1845 appeared

her "Memoirs of the Early Italian Painters, and of the Progress of Painting in Italy from Cimabue to Bassano" (2 vols. 18mo.), containing 30 biographies, which cover a period of about 3 centuries, and forming one of the most useful manuals of Italian art in any language. A new edition containing additional biographies and other matter appeared in London in 1859. Her next publication, "Memoirs and Essays on Art, Literature, and Social Morals" (8vo., 1846), contains, among other miscellanies, a paper on the works and genius of Washington Allston. A more elaborate work than any of the preceding was her "Sacred and Legendary Art" (2 vols. 8vo., 1848), which, with the "Legends of the Monastic Orders" (1850), and "Legends of the Madonna" (1852), had employed her for many years. In this series she has sought to trace the progress of sacred art through its various phases, to explain the symbolical form in which the old masters were accustomed to clothe their ideas, and to indicate the purity and beauty of their conceptions. The numerous skilful etchings by the authoress from original pictures, illustrating her subject, combine to render the series one of the most valuable recent contributions to the history of art. Her remaining works are: a "Commonplace Book of Thoughts, Memories, Fancies," &c. (8vo., 1854), comprising her desultory reflections on many subjects, recorded from time to time; and "Sisters of Charity Abroad and at Home" (1855), the substance of a lecture delivered before a female audience in Feb. 1855. A new work on art, in continuation of the series above mentioned, is announced (1860) under the following title: "The Scriptural and Legendary History of our Lord and his Precursor, John the Baptist, with the Typical Characters and Subjects of the Old Testament as illustrated in the Fine Arts."

JAMESON, ROBERT, a Scottish naturalist, born in Leith, July 11, 1774, died April 17, 1854. He studied medicine in the university of Edinburgh, and, after some mineralogical explorations in different parts of Scotland, went in 1800 to Freiberg, and became a pupil of Werner, the mineralogist, whose geological dogmas he adopted with enthusiasm. Returning to Edinburgh in 1804, he was soon after appointed professor of natural history in the university of that city, a position which he held until his death, a period of nearly 50 years. For many years he was an active advocate of the Wernerian theory in opposition to that of Hutton, but finally adopted and taught the latter. His publications are purely of a scientific character, and include manuals of instruction, and many contributions to scientific journals. His most elaborate works are his "System of Mineralogy" (3 vols. 8vo., 1804-'8), and "External Characters of Minerals" (1805). In 1819 he established the "Edinburgh Philosophical Journal," of which for many years he was the sole editor. He is also the author of the articles on "Geology," "Mineralogy," and "Organic Remains" in the "Encyclopædia Britannica."

JAMESONE, GEORGE, a Scottish portrait painter, born in Aberdeen in 1586, died in Edinburgh in 1644. He was a fellow pupil with Vandyke in the studio of Rubens, and has been called by Walpole "the Vandyke of Scotland," from his resemblance to the style of that master. Little is known of his career, save that it was a prosperous one. His pictures are found in many old family mansions in Scotland, and among his sitters was Charles I. on the occasion of his visit to Edinburgh in 1633. He occasionally painted history and landscape, and is said to have illuminated a manuscript of 200 pages illustrating the life of Christ.

JAMESTOWN, the first English settlement in the United States, situated within the present limits of James City co., Va., on a point of land projecting from the N. bank of James river, 32 m. above its mouth. The encroachments of the river are gradually converting the promontory into an island; the site of the settlement is already separated from the mainland by a marsh, and a portion of it has been entirely swept away. Two or three old houses, a ruined church, and the remains of a fort are now the only relics of the ancient town. Jamestown was founded in 1607 by 105 colonists sent out by the London company under command of Christopher Newport. Capt. John Smith and Bartholomew Gosnold were prominent members of the expedition. Their fleet, consisting of 3 vessels, entered the Chesapeake, April 26, and sailing up the James river, which they named in honor of the reigning king of England, anchored off a beautiful promontory, where in May they began to build a town. During the first season of their arrival the colony was exposed to extreme want and danger, and it was only saved from speedy destruction by the energy of Capt. Smith, and the good offices of Pocahontas. The first colonial assembly ever convened in America was held at Jamestown, June 29, 1619. Nathaniel Bacon, during the rebellion which took its name from him, in 1676, burned the town to the ground.

JAMI, or **DJAMI** (**ABDERRAHMAN BEN AHMED**), a Persian poet, born in A. D. 1414, died in 1492. He derived his surname Jami from the place of his birth in Khorassan. After excelling in other studies, he applied himself to the mystical doctrines of the Soofees under the celebrated sheik Saad-Eddin of Cashgar, and with so great success that he was judged worthy to succeed that master in his school. His eloquence, amiable character, and the beauty of his poems, made him a favorite of the most illustrious personages, of the vizier Ali Shir, the sultans Abu Said and Hossein Mirza, and also Mohammed II. and Bajazet II. He was equally esteemed by the common people, whom he instructed beneath the portico of the mosque of Herat in the principles of morals and religion. He is one of the best, most learned, and most voluminous of the Persian poets, and composed about 50 works in prose and verse, in Arabic and Persian. Among the more important of

them are "Yusuf and Zuleika," translated into English by Th. Law in the "Asiatic Miscellanies," and published in German with the original text by Rosenzweig (Vienna, 1824); *Setselet ad dzeib* (the "Golden Chain"), a satirical poem against two heretical sects, edited by F. Falconer (London, 1848); "Selman and Absal," edited by F. Falconer (London, 1850); *Kird nameh Iskenderi* ("Book of the Wisdom of Alexander"); *Nisab tedjnis al loghat*, translated by F. Gladwin under the title of "Resemblances, Linear and Verbal" (2d ed., London, 1811); *Beharistan* (the "Abode of Spring"); and the prose work *Nasahat ul ins* ("Breath of Saints"), a history of mysticism.

JAMIESON, JOHN, D.D., a Scottish clergyman and author, born in Glasgow, March 3, 1759, died in Edinburgh, July 12, 1838. He was the son of a Secession minister settled in Glasgow, and at the age of 9 was sent to the university of that city with a view of being trained to the ministry. At the age of 20 he was licensed as a preacher, and in 1781 was ordained as pastor over a small congregation in Forfar, where he remained for 16 years on a salary of £50. In the interim he published "Socinianism Unmasked" (1786), "The Sorrows of Slavery, a Poem" (1789), "Sermons on the Heart" (2 vols. 8vo., 1789-'90), and "A Vindication of the Doctrine of Scripture and of the Primitive Faith concerning the Deity of Christ" (2 vols. 8vo., 1794), a work highly commended for its scholarship, and in which the arguments of Priestley in his "History of Early Opinions" are ably combated. In 1797 he was settled over a congregation in Edinburgh, where he passed the remainder of his life. In 1802 appeared his "Use of Sacred History" (2 vols. 8vo.), and in 1808-'9 his most important work, "Etymological Dictionary of the Scottish Language" (2 vols. 4to.), of which he published in 1818 an 8vo. abridgment, followed in 1825 by a supplement to the large edition in 2 vols. 4to. It evinces great industry and erudition, and, although its accuracy has been questioned in some instances, has proved invaluable to the students of early Scottish literature. Among his remaining works are: "Hermes Scythicus, or Radical Affinities of the Greek and Latin Languages to the Gothic" (8vo., 1814); "Historical Account of the Ancient Culdees of Iona" (4to., 1811); "Grammar of Rhetoric and Polite Literature" (12mo., 1818); editions of Barbour's "Bruce," and Harry the Minstrel's "Sir William Wallace;" beside a number of occasional sermons, poems, &c. He received the degree of D.D. from Princeton college, N. J., and during the last 5 years of his life enjoyed a literary pension of £100.

JANES, EDMUND STONER, D.D., an American clergyman, and bishop of the Methodist Episcopal church, born in Sheffield, Berkshire co., Mass., April 27, 1807. When about 4 years of age his parents removed to Salisbury, Conn. From 1824 to 1830 he was engaged in teaching. During 3 years of this period his leisure was employed in

the study of the law, and he had formed an engagement to enter upon practice when the sudden death of his partner interrupted his plan and changed his purpose. From this period he resolved to preach the gospel, and in April, 1830, he started for his appointment in the Philadelphia conference. After 6 years' study of theology, and while engaged in the active duties of the pastoral work, he took up the study of medicine, though with no intention of becoming a practising physician. He was ordained deacon in 1832, and elder in 1834. In May, 1840, he was elected financial secretary of the American Bible society, and continued in that office until he was elected bishop in 1844. Bishop Janes is one of the most efficient and laborious members of the episcopal college.

JANESVILLE, a city and the capital of Rock co., Wis., in the S. part of the state, situated on both sides of Rock river, 45 m. S. E. from Madison; pop. in 1850, 3,441; in 1857 (city and township), 7,788; in 1859, about 12,000. It is built partly on a bluff 100 feet high, and partly on a level space at its foot, extending to the river. The court house occupies a commanding position on the summit of the bluff. An active trade is carried on by the Milwaukee and Mississippi and the Chicago and north-western railroads, which intersect at this point, and a large amount of capital is invested in manufactures, Rock river affording valuable water power. In 1857 the city contained 4 flour mills, 2 saw mills, a brewery, 3 carriage factories, 2 machine shops, a planing mill, an insurance company, 5 banks with an aggregate capital of \$325,000, 2 daily and 2 weekly newspaper offices, and 9 churches (1 Baptist, 1 Congregational, 1 Episcopal, 4 Methodist, 1 Presbyterian, and 1 Roman Catholic). It is the seat of the state asylum for the blind, supported by legislative appropriations, and open to pupils from Wisconsin free of charge except for clothing. This institution was founded in 1850, and in 1858 had 18 pupils. Janesville also has an academy and a female seminary. In 1858 it had 16 school houses (8 of which were of brick, and 2 of stone), attended by 5,307 pupils. It was founded about 1836, made the county seat in 1839, and incorporated as a city in 1853.

JANIN, JULES GABRIEL, a French critic and miscellaneous writer, born of Jewish parents at St. Etienne in Dec. 1804. He completed his classical studies at the college of Louis le Grand in Paris, where he was more distinguished for his wit and conversational powers than for high rank in his classes. He then studied law and made a living as a private tutor; but he soon became one of the contributors to the *Figaro*, a sprightly opposition paper, and was also a regular writer for the royalist journal, the *Quotidienne*, until the accession of the Polignac cabinet in Aug. 1829. A few weeks later he became a regular contributor to the *Journal des débats*; and after writing a few political and miscellaneous articles, he took charge of the theatrical notices, in which he found a proper field for the

display of his peculiar powers. His articles are less criticisms than short essays, written in a colloquial style and sparkling with exuberant wit, humor, and fancy. His contributions to the *Journal des débats* have not monopolized his pen. Beside numerous prefaces, introductions, &c., and articles in nearly every Parisian periodical which has existed during his career as a journalist, he has published several novels, the first of which, *L'âne mort et la femme guilotinée* (1829), has gone through several editions. His subsequent writings of the same class have scarcely been so well received; among them are: *La confession* (1830); *Barnave* (1831); *Le chemin de traverse* (1836); *Un cœur pour deux amours* (1837); *La religieuse de Toulouse* (1850); and *Les gaités champêtres* (1851). He has prepared an abridgment of Richardson's "Clarissa Harlowe," with an *Essai sur la vie et les ouvrages de Samuel Richardson* (2 vols. 12mo., Paris, 1846). Among his miscellaneous works, exclusive of several illustrated publications, historical or descriptive, to which he has done little more than lend his name, are: *Contes fantastiques et contes littéraires* (1832); *Contes nouveaux* (1833); *Les catacombes* (1839); *Le voyage d'un homme heureux* (1840); *Les petits bonheurs* (1856); *Les symphonies de l'hiver* (1857), with drawings by Gavarni; and *Rachel, et la tragédie*, a biographical and critical work upon that great tragic artist, with photographic illustrations (8vo., 1859). His *Histoire de la littérature dramatique en France* (4 vols., Paris, 1851-'6) is a selection of his weekly *feuilletons*, altered and remodelled so as to present a sketch of the history of the French stage and dramatic artists during nearly a quarter of a century.

JANINA, JOANNINA, or YANINA, capital of an eyalet or circle of Albania of the same name (pop. 400,000, chiefly Greeks), in European Turkey, occupies a small peninsula on the bank of the lake of Janina, in lat. 39° 47' N., long. 21° 1' E., 80 m. from Larissa; pop. about 12,000. It is the seat of a Greek metropolitan, and contains 7 churches, 14 mosques, a Greek college, a library, and a hospital. The inhabitants are engaged in various manufactures. The adjoining country yields grain, fruits, wine, and timber in abundance, is rich in pasture lands, and affords great advantages for the raising of cattle and horses. The descriptions given by recent travellers of the site of Janina and its lake answer to that of the city and lake of Euroa mentioned by Procopius. Justinian built a fortress at Euroa, probably on the site now occupied by the citadel of Janina. In the later period of the Byzantine empire it became the chief city of Greece W. of Mt. Pindus. For many centuries the territory of Janina was a field of contention between the Byzantine Greeks and the Wallachian and Slavic settlers. In the latter part of the 11th century it was taken by the Normans, who defeated Alexis Comnenus under its walls. Toward the middle of the 15th century it fell into the hands of the Turks. At the beginning of the present century Janina

enjoyed a high degree of prosperity, numbering nearly 40,000 inhabitants, possessing an extensive trade and a large annual fair, and the Janinotes ranking among the most accomplished and industrious of modern Greeks. But the despotic rule of Ali Pasha, the governor of the city, led to complications with Turkey and other governments. In 1820, when no longer able to defend the city, he ordered it to be set on fire. The mosques, palaces, and the two academies for which Janina was celebrated, were all destroyed. It has still a desolate appearance, the streets being narrow and crooked, and the houses mostly of mud; but it is gradually recovering from its misfortunes, and trade is reviving. Opposite the city is a small island with a fishing village and a church and monastery.—The lake of Janina is about 6 m. in length and almost 3 in its greatest breadth, bounded on the N. E. by the Mitzikeli mountains (2,500 feet high), and on the S. E. by a rocky mountain crowned with the ruins of an Epirote city, which is supposed to have been the ancient Dodona. The N. W. part of the lake is commonly called the lake of Lapsista, and the S. E. that of Janina. The middle part, however, resembles more a marsh than a lake, and is traversed by two long channels which connect the two portions. The waters of both lakes are absorbed by subterranean channels; that which communicates with the river Kalama (the Thyamis of the ancient Greeks) is in the lake of Lapsista. The lake of Janina abounds with pike, perch, carp, tench, eels, and other fish. Immense numbers of wild fowl breed in the covert of the lofty reeds upon its shores.

JANIZARIES, a body of Turkish infantry now extinct. The name is derived from *yeniskeri*, or *yeni* and *askari*, "new troops." According to a Turkish historian, they were first assembled in 1329 by Sultan Orchan, but they were not regularly organized until 1362, when Amurath I., after conquering the southern Slavic kingdoms, claimed one fifth of the captives, including the able-bodied youth, to be converted to Islamism and educated as soldiers. This was done with extraordinary care, the recruits being distributed at first among the peasantry of Asia Minor, that they might become hardened by rural life and familiar with Mohammedanism. The result was that they manifested all the enthusiasm of proselytes; and as this spirit was warmly encouraged, and as privileges were granted them, they soon became a formidable means of defence. They were divided at first into 80, afterward into 162, and finally into 196 *ortas*, each numbering in Constantinople nominally 100 men, and elsewhere 200 or 300, in time of peace, but 500 in time of war. Beside the *aga*, or commander-in-chief of the whole body of janizaries, there were 6 officers attached to each *orta*, the chief being called the *orta-bashi*. The lowest officer was the cook, who, however, performed various other duties, and for whom the soldiers manifested great reverence. They never

appeared without a wooden spoon in their turbans, and on extraordinary occasions always assembled around their soup kettles; their revolts were proclaimed by reversing these kettles, and to lose one of them in battle was looked upon as a disgrace equivalent to the loss of its colors by a regiment in other armies. Under Solymán the Magnificent they formed the best disciplined and boldest force in Europe. After his death, when the sultans ceased to lead their armies in person, the institution fell into decay. It was no longer recruited exclusively from young Christian prisoners of war, or from levies on the Slavic provinces, but from any persons who could obtain appointments in it by intrigue, until finally it consisted in a great measure not merely of menials and low artisans, but of idle vagabonds, many of whom followed no military exercises and were permitted to engage in trade or mechanical and other occupations. But they still supplied something like an organization to the turbulent mob of the Turkish cities, and were long really formidable to society and government itself. They mutinied repeatedly against the sultans, and in some cases even deposed them or put them to death. They frequently pillaged the cities which it was their duty to guard. In 1798 Selim III. attempted to form a better army by instituting the *nizam-djadid* or disciplined troops. This caused a fearful revolt, the abdication and death of Selim, and the most terrible outrages ever witnessed in Constantinople (Nov. 14, 1808). Mahmoud II. was obliged on reaching the throne to pardon the janizaries; but, impressed by the danger of maintaining such troops, he quietly matured during several years a plan for ridding himself of them. Having gained over some of their officers and the Mohammedan priesthood to his views, he resolved to exterminate them, and on May 29, 1826, published a decree ordering that 150 janizaries of every regiment should be formed into a regularly disciplined militia. This, as was expected, led to a revolt (June 14, 1826), the janizaries committing horrible excesses. The next day they assembled and reversed their kettles. But the multi displaying the sacred standard of Mohammed, all the better class of the population joined the regular troops. Artillery had been long prepared in anticipation of this event, and great numbers of *galiongis* or sailors, and *bostangis* or imperial private guards, were also ready for attacking the janizaries. "Burned alive in their barracks, cannonaded in the At Meidan, where they made their most desperate defence, massacred singly in the streets during 3 months, the remainder were condemned to exile." About 25,000 janizaries were thus killed, and since that time they have never been reorganized.—See Macfarlane's "Constantinople in 1828," and *Précis historique de la destruction du corps des janizaries, traduit du Turc d'Ess'ad Effendi*, by M. Caussin de Perceval (Paris, 1833).

JANSENIUS, CORNELIUS, a Dutch theologian, born at Akoi near Leerdam, Oct. 28, 1585, died

May 6, 1638. He studied theology at the university of Louvain, which unwaveringly adhered to the Augustinian system of Bajus (died 1589), though 76 propositions of it had been condemned in 1567 by the see of Rome. In 1617 he became president of the Pulcheria college at Louvain, where he lectured on theology, and in 1630 professor of theology at the university. In 1636 he was made bishop of Ypres. He was zealously devoted to the study of Augustine. The writings of this father against the Pelagians he read 30 times, the other writings 10 times. Like Bajus he adopted the Augustinian doctrine of grace in its strictest sense, and was therefore opposed to the theological views of the Jesuits, whom he prevented from lecturing at Louvain on philosophy. He believed that the Catholic church of his times had in this and in other points departed from the doctrines of the old church, and therefore in 1621 projected, with his friend the abbot of St. Cyran, the plan of a reformation, Jansenius taking the doctrine and St. Cyran the constitution and the religious life as their respective fields of labor. Irish clergymen of high standing and the heads of the French Oratorians favored this plan. Jansenius commenced his work on the doctrine of Augustine in 1627, and had hardly finished it when he died. On his deathbed he recommended to his friends its publication, which the Jesuits and the papal nuncio at Cologne, anticipating the renewal of a violent controversy, strove in vain to prevent. It appeared (3 vols. fol.) under the auspices of the university, and the editorial care of Liberius Froidmont and Kalen, in 1640, with the title *Augustinus, seu Doctrina Augustini de Humana Naturæ Sanitate, Aegritudine et Medicina, adversus Pelagianos et Massilienses*, and was soon reprinted at Paris (1641) and Rouen (1643). The work sets forth the Augustinian doctrine of irresistible grace and absolute election or rejection, mostly in the very words of Augustine; it rejects the use of reason in religious questions, designates philosophy as the mother of all heresy, defends Bajus, and accuses the Jesuits in general, and in particular Fonseca, Less, Molina, and others, of semi-Pelagianism. The Jesuits attacked the work as repeating the condemned propositions of Bajus, and Urban VIII. in 1642 condemned it as heretical by the bull *In eminenti*, and placed it on the index.—The name JANSENISTS is applied to those Christians who consider the opinions of Jansenius as the true doctrine of the Catholic church, notwithstanding their condemnation by all the popes since 1642. The friends of Jansenius in the Netherlands, among whom were several bishops and nearly all the professors of the universities, submitted after some hesitation to the bull *In eminenti* in 1647. A greater resistance was made in France, where the abbot of St. Cyran, Anthony Arnauld, a learned doctor of the Sorbonne, his sister Angelica, the abbess of the Cistercian convent of Port Royal, Pascal, and a community of scholars who lived in the manner of the ancient anchorites in the vicinity of Port Royal des Champs

(*messieurs de Port Royal des Champs*), took their stand in favor of Jansenius. When Innocent X. in 1653 denounced 5 propositions in the works of Jansenius as heretical, a majority of the Jansenists denied that these propositions had been understood by the author in the sense in which they were condemned. Alexander VII., however, in 1656 demanded of the French clergy a declaration, by which they should reject the condemned propositions as propositions of Jansenius. Louis XIV. lent his support to the execution of this as well as other measures of the popes against Jansenism, declaring at a national assembly of the French clergy (1660) that he regarded it as his religious duty to exterminate Jansenism. Clement IX. in 1668 endeavored to put a stop to the controversy by a decree (*Pax Clementina*), which demanded merely a rejection of the 5 propositions, without ascribing them to Jansenius. (*La paix de Clément IX.*, Brussels, 1701. The author, who is not named on the title page, was Quesnel, who died in 1719.) But Clement XI. and Louis XIV. soon had recourse to severer measures; many Jansenists fled to the Netherlands, and Port Royal was destroyed in 1709. The controversy had broken out with new violence on the publication of Quesnel's celebrated work on the New Testament (*Le Nouveau Testament en Français, avec des réflexions morales*). Clement XI., by the constitution *Unigenitus* (1713), condemned 101 propositions of this book as heretical, dangerous, or offensive to pious ears. A large portion of the French clergy and people, with the archbishop of Paris, the cardinal de Noailles, at their head, publicly resisted the constitution, and were therefore called Anticonstitutionists. A papal decree of Sept. 2, 1718, threatened all who would not unconditionally submit with excommunication. Many, and among them Cardinal Noailles, yielded, but 4 bishops (those of Mirepoix, Montpellier, Boulogne, and Senez) appealed to an œcumenical council. Those who sustained this appeal, among whom were many opposed to Jansenism, were called Appellants. The parliament perseveringly resisted the decrees against Jansenism; the Sorbonne wavered, and when pressed generally submitted to the papal decrees. Some of the bishops continued to patronize it, and the general chapter of the Oratorians resolved in 1727 not to accept the bull *Unigenitus*. A popular saint, Francis of Paris, died with the appeal in his hand (1727), and the miracles and wild convulsions which were reported to have taken place at his grave made a deep impression on large classes of the people. But when the constitution by an act of royal sovereignty had been enforced as a law of the kingdom (1730), the resistance of the Jansenists was gradually overcome, and the Oratorians accepted the bull in 1746. New difficulties arose again for a while when Beaumont, archbishop of Paris, in 1752 ordered the sacraments to be refused to all who had not accepted the constitution; but finally peace was restored by means of a mild pastoral letter from Benedict

XIV. in 1756. The Jansenist party remained very strong among the French clergy, and most of the clerical deputies in the states-general of 1789 belonged to it. After the restoration also, it found many advocates among the clergy and laity, and since 1854 has had an organ in the religious press (*L'observateur Catholique*). In Italy several bishops who were in favor of the reforms of Leopold II. of Tuscany and of Napoleon, as Ricci, bishop of Pistoja, and Capece-Latro, archbishop of Taranto, were regarded as Jansenists.—While Jansenism remained in France a theological school, it became an independent church in the Netherlands. In 1704 Codde, the vicar apostolic of the archbishopric of Utrecht, was deposed by the pope for holding Jansenistic views, but the chapter refused to acknowledge the validity of this deposition. In 1723 the chapter chose an archbishop of Utrecht, who was consecrated by the bishop of Babylon, a French bishop *in partibus*, who lived as a fugitive at Amsterdam. The pope was informed of the election, but answered by a condemnatory brief. The archbishop appealed from the condemnation of the pope to the next general council, a step which has since been taken by each of his successors. The next archbishop, Barchman Wuytens, received letters of communion from many bishops, more than 100 of which are preserved in the archives of the church of Utrecht. After the death of the bishop of Babylon, Archbishop Meindaarts (elected in 1739) restored the suffragan see of Haarlem in 1742, and that of Deventer in 1758, in order to secure a succession of prelates. The last public step taken by the bishops of the Jansenist church was a joint protest against the doctrine of the immaculate conception in 1856. The Jansenist church numbers at present about 4,000, with a theological institution at Amersfoort.—See Leydecker, *Historia Jansenismi* (Utrecht, 1695); Lucchesini, *Historia Polemica Jansenismi* (3 vols., Rome, 1711); Tregelles, "The Jansenists" (London, 1851); the Rev. J. M. Neale, "History of the so-called Jansenist Church of Holland" (Oxford, 1858).

JANSSENS, ABRAHAM, a Flemish painter, born in Antwerp in 1569, died about 1631. He enjoyed the highest reputation in Antwerp until Rubens established himself there after his residence in Italy. In vigor of coloring he is scarcely inferior to Rubens.

JANUARIUS, SAINT, a Christian martyr, patron saint of Naples, born in Naples, or according to some accounts in Benevento, April 21, 272, put to death at Pozzuoli, Sept. 19, 305. He was made bishop of Benevento about 303, the year in which the persecution under Diocletian began. Having ventured to visit some Christians who had been cast into prison for their faith, he was brought before the governor Timotheus at Nola, and afterward with other prisoners made to accompany that officer to Pozzuoli, walking in chains before his chariot. Here, says the tradition, Januarius and 6 others were given up to wild beasts; but, the animals

refusing to harm them, they were condemned to be beheaded. The relics of Januarius were removed about 400 to Naples, where his body is supposed to be still preserved in a chapel of the cathedral. Two vials containing a hard substance believed to be the blood of the saint, and a glass case enclosing his head, are kept in another chapel and exposed to public view on certain festivals; and when the head is brought near the vials the blood is seen to become liquid, to bubble, rise in the bottles, and fall again—the alleged miracle lasting sometimes 8 days. On such occasions popular enthusiasm is raised to its height. The occurrence usually takes place on the feast of St. Januarius, Sept. 19, on that of the translation of his relics in May, and on the anniversary of an eruption of Vesuvius which is believed to have been extinguished by his invocation, Dec. 20, 1631; but it is also observed at other times. The nature of this phenomenon has been investigated by scientific men of various creeds and nations, and several hypotheses more or less plausible have been suggested to account for it. Roman Catholics regard it as a well attested miracle. It was mentioned by Pope Pius II. in 1450.

JANUARY, the first month in our present calendar, added with February to the previous 10 months of the year by Numa. It was named from the double-faced god Janus, to whom its first day, which looks back upon the year past and forward upon that to come, was sacred. It was not uniformly the beginning of the year among the Latin Christian nations till the 18th century, the year being in several countries reckoned from March 1, or other dates.

JANUS AND JANA, two divinities honored by the ancient Romans. Their names are only corruptions or abbreviations of Dianus and Diana. They were generally considered identical with the sun and moon. Janus presided over the beginning of every thing, and was therefore invoked on every occasion before all other deities. He opened the year and the seasons; he was the janitor of heaven, and on earth the guardian god of gates and doors; in time of war he went out to battle with the armies of Rome, and aided them against the foe, while in time of peace he abode in his temple, and watched over the safety of the city. At the dawn of every day the people addressed their supplications to him, and on the first day of every year sacrifices of cakes, barley, incense, and wine were offered in his honor on 12 altars. The worship of Janus is said to have been introduced into Rome by Romulus. Numa called the first month of the Roman year after him, and dedicated a covered passage near the Forum to him. This passage, frequently termed a temple in later times, contained a statue of the god, and had two entrances, which were always kept open in time of war, and closed in time of peace. During the existence of the republic the temple was closed only once, at the end of the first Punic war, 241 B. C. Janus was sometimes represented with two, and sometimes with four faces,

and was often styled *Bifrons* and *Quadrifrons*. He was frequently represented in works of art with a staff or sceptre in his right hand, and with a key in his left.

JAPAN (Chinese *Shi-pen-kue*, or as Marco Polo wrote it, *Zipan-gu*, sunrise kingdom), called by the natives Nippon, or Nipon, which is the specific name of the largest member of the group, is a body of islands, forming an empire, lying off the coast of Asia, between lat. 31° and 49° N. and long. 129° and 150° E. It is bounded N. by the sea of Okhotsk, E. by the Pacific ocean, S. by the China sea, and W. by the sea of Japan. It is distant 420 m. from China, 270 from Kamtschatka, and 5,000 from California. The principal islands of the group are Nippon, Kiusiu, and Sikokf. Nippon is one of the largest islands of the globe, its length being 900 m., and its average breadth more than 100 m.; its area is about 100,000 sq. m. Kiusiu has an area of about 16,000 sq. m. Sikokf contains about 10,000 sq. m. These last two islands lie S. and S. W. from Nippon, from which they are separated by narrow straits; Bungo channel, about 30 m. wide, divides them from each other. Nippon, Kiusiu, and Sikokf, and numerous small islands in their immediate vicinity, constitute Japan proper. North of Nippon, and separated from it by the straits of Sangar, lies the island of Yesso or Jesso, which has been conquered and colonized by the Japanese; its area is estimated at 30,000 sq. m. Still further N. is the island of Saghalien, the S. part of which, together with the 3 southernmost islands of the Koorile chain, belong also to Japan. The entire number of the Japanese islands is computed at 1,000, and the whole area of the empire at 170,000 sq. m. Japan is divided by the native geographers into 8 grand divisions, viz.: Gokynay, Tokaydo, Tosando, Fukurokudo, Sanindo, Sanyodo, Nankaydo, and Saykaydo. These are subdivided into 68 provinces or principalities, and these again into 622 districts. The most noted cities of Japan are Yeddo, the political capital, Miako, the ecclesiastical capital, and Osaka, in Nippon; Nagasaki, Saga, Kokura, and Taakanabe, in Kiusiu; Simoda, Kotsi, Takamatsu, and Matsugama, in Sikokf; Hakodadi and Matsmai, in Yesso. The population is unknown to foreigners, for though censuses are frequently taken the result is kept secret; but it is believed by competent observers to be very dense. If the average to the square mile be as great as that of the neighboring empire of China, the Japanese population cannot be far from 40,000,000. The people are all of one race, and belong to the Mongolian division of mankind.—The coasts of Japan are much broken by bays and inlets, and are extremely difficult of access, not only from the multitude of rocks and islands that surround them, but from the prevalence of gales and fogs. The rivers are numerous, but none are large; they are mostly mountain torrents, with short and rapid courses. The principal streams are the Yedegawa, which is the outlet of Lake Oits, and falls into the gulf of

Osaka; the Kisogawa, which falls into the gulf of Izeh; the Teuriogawa, which is the outlet of Lake Suwa; the Kamanafi, which flows into the bay of Taga; and the Aragawa, which flows into the bay of Yeddo. The chief lake is that of Oits, situated in the province of Oomi; it is 72 m. long, and 22 in its greatest width. The Japanese islands are mountainous, but little is known of the direction or nature of the ranges. The highest peak is Fusi-yama, a volcano in the island of Nippon, westward from the bay of Yeddo; its summit is covered with perpetual snow, and it must therefore be at least 12,000 feet above the sea. The whole group of islands seems to be volcanic in its formation, but too little is yet known of its natural features to enable us to speak with certainty of its geological character. Earthquakes are so frequent that the natives commonly pay little regard to them. Though there are some large plains, the surface of the country is in general very much broken by hills and valleys. The soil is fertile, and is almost everywhere cultivated, agriculture being greatly promoted by a law which provides that land remaining unused for more than a year shall become forfeited to the public. The rugged mountain sides, where the plough cannot be used, are often built up in terraces, and tilled by hand. Rain is abundant, especially in spring and summer, and this copious irrigation is a main cause of the fertility of the soil. The heat of summer is very great, the mercury rising in July and August to 100° . In winter the cold is sometimes severe, even in the southern part, where the mercury falls much below the freezing point. The weather is subject to great and sudden changes, and violent storms with thunder and lightning are very common.—Japan produces gold, silver, copper, lead, quicksilver, coal, sulphur, and salt in great abundance. Tin and iron are found, but not so plentifully as the other minerals. Gold is obtained in many parts, both from the ore and from washing the earth or the sands of the rivers. Silver is also abundant, but both gold and silver are less plentiful than they were a few centuries ago. The mines have become less productive, and the precious metals scarcer, probably in consequence of the immense exportation. It is said that from 1540 to 1740 not less than \$200,000,000 worth was exported in specie. Copper is extremely abundant in all parts of Japan, and much of it is of the best quality. Iron is found only in 3 provinces, and from its comparative scarcity is of the same value with copper. The tin of Japan is so fine and white as almost to equal silver; but as the Japanese attach little value to it, it is not mined to any great extent. Sulphur is found in some places in such quantities that it may be dug up and carried off as easily as sand. Coal of a bituminous kind, and of a poor quality, is dug in many places, and is extensively used as fuel. Among the precious stones are agates, carnelians, and jaspers of great beauty, while pearls, frequently of large

size, are fished on many parts of the coast.—Japan produces most of the trees common to temperate regions. The fir and cedar grow to immense size, the latter sometimes to the diameter of 18 feet. Of the oak, two species have been observed peculiar to the country, whose acorns when boiled form a palatable and nutritious article of food. The mulberry and the varnish tree grow wild. The nuts of the latter yield solid oil for candles, as do those of the camphor tree, which lives to a great age, and attains a great size. The Dutch traveller Siebold measured one in 1826, the trunk of which was 50 feet in circumference. The same tree had been observed by the traveller Kämpfer in 1691, when it was 36 feet in circumference. The people cut the root and stem into small pieces, and procure the camphor by decoction. It has long formed an important article of export. Chestnut and walnut trees are found, and oranges, lemons, figs, plums, cherries, and apricots are among the fruits. The bamboo, the box tree, the juniper, and the ivy are also produced. The camellia, cultivated in several hundred varieties, grows to a large size, and is a great favorite both for the beauty of its leaves and of its flowers. The food of the people consists chiefly of vegetables. Rice, wheat, maize, barley, and buckwheat are raised in abundance, and also pumpkins, watermelons, onions, beets, carrots, turnips, asparagus, beans, peas, sweet potatoes, yams, and egg plants and radishes of enormous size. Tobacco is also cultivated, of a very mild quality. The density of the population of Japan and the nearly universal prevalence of careful cultivation of the soil render the existence of wild animals of the larger species almost an impossibility. Among the mountains are bears, wild boars, deer, foxes, and hares. Neither are tame animals numerous, as their flesh is little used for food. The native horses are small, active, and hardy. Oxen and cows are employed in ploughing and in carrying burdens. Dogs are numerous, and there is a small highly prized species of spaniel, from which it is supposed was derived the English variety known by the name of King Charles.—The Japanese are of middling size, and generally of a yellow color, though some are brown and others nearly white. Their eyes are small, oblong, and deeply sunk in the head. Their noses are short and thick, and their hair thick, black, and glossy. The people of rank have generally fair complexions, and ladies who are not exposed to the sun have sometimes perfectly white skins and blooming cheeks. The men are vigorous and active, and the women well formed and graceful, while both sexes exhibit a higher degree of intelligence than is common among Asiatic nations. In character they are lively and volatile, quick of apprehension, daring, adventurous, frank, liberal, and hospitable. They are peculiarly fond of military life, and make excellent soldiers and sailors. They learn rapidly, and show great eagerness and much aptitude for the ac-

quisition of the highest branches of European knowledge. Though industrious, they are eminently a social and pleasure-seeking people, are fond of feasts and frolic, and have frequent national holidays. Music, dancing, and the theatre are favorite amusements with all classes. Mimmers, mountebanks, tumblers, conjurers, and all manner of jugglers are seen in the streets of the cities, and are highly popular with the people. Their jugglers surpass those of all other countries. Among other wonderful feats, that which has especially astonished their European and American visitors is the formation from pieces of tissue paper of artificial butterflies, which, guided by the motions of a fan, fly about, advance, retreat, appear to sip the honey from flowers, and display all the airs and graces of real butterflies. Education is almost universal, the poorest and lowest laborers being taught to read and write. The women are educated with nearly as much care as the men. The young ladies of the upper classes spend much of their time in the fabrication of pretty boxes, artificial flowers, pocket-books, and purses, and in the painting of fans and pictures of birds and animals. In fine weather they join with the men in all sorts of outdoor and rural amusements, taking especial delight in fishing on the lakes and rivers, in vessels elegantly fitted up and adorned. A highly intelligent and accomplished Englishman, James Drummond, who resided several years in Japan, about the beginning of this century, says: "The Japanese are the most fascinating, elegant ladies that I ever saw in any country in the world. Take away a few peculiarities to which one soon gets accustomed by living among them, and they would at their first debut be admired at St. James's or in any other court of Europe." The Japanese gentleman is invariably described as a person of pleasing address and most polished manners. Even the commonest people are neat in their persons and scrupulously observant of the forms of politeness. The rules that govern social intercourse are formed into a regular system, and published in books, which are diligently studied at school. Tea is a universal beverage, and smoking is general among the men. In a morning call pipes and tea are served to the guests as regularly as pipes and coffee are among the Turks. At the conclusion of the visit sweetmeats are handed to the visitor on a sheet of white paper ornamented with tinsel; these are eaten with chopsticks, and if the guest does not eat the whole, he or she is expected to fold up the remainder in the paper and carry it away. At grand dinners each guest is expected to take with him a servant or two to carry off in baskets the remnants of the banquet. Fish is a general article of diet, and is varied with game, venison, poultry, and all sorts of vegetables, including a kind of sea weed. Food is eaten out of light lacquered bowls and dishes made of papier maché. Feasts are followed by music and dancing, and are commonly closed by drinking tea

and a spirit called *sackee*. It is the custom on the completion of a new dwelling house to give a house-warming, for which purpose the neighbors and friends of the master of the new house send him liberal presents of eatables and drinkables. The ordinary dress of both sexes and of all ranks is very similar in form, differing chiefly in the colors, fineness, and value of the materials, those of the higher orders being generally of silk, and of the lower orders of linen or calico. The dress consists of a number of loose, wide gowns worn over each other, with the family coat of arms woven or worked into the back and breast of the outer garment, and all fastened at the waist by a girdle. The sleeves are very long and wide, and the part of the sleeve that hangs below the arm is made to serve as a pocket. The women usually wear brighter colors than the men, and border their robes with gay embroidery or gold. Upon occasions of full dress a cloak is worn together with a sort of trousers called *hakkama*. Within doors socks are the only covering of the feet. Shoes are worn abroad, of an awkward and inconvenient kind, consisting of soles of straw matting or of wood, which on entering a house are always taken off. Neither men nor women wear any covering on their heads, except occasionally as a protection from rain. They screen their faces from the sun by the fan which is carried by all classes, by ladies, priests, soldiers, and beggars. The greatest peculiarity of Japanese costume, however, is the sword, the wearing of which is a mark of rank; it is strictly prohibited to the lower orders. The middling classes carry one, and the higher ranks two swords, which are worn on the same side, one above another. The houses of the Japanese are low, and built of wood. The walls are coated with a cement that gives them the appearance of stone. In the windows the place of glass is supplied by very fine strong paper, which is protected from rain by external wooden shutters. Verandas encircle the houses, and to almost every dwelling, even in the cities, there is attached a garden. Store-rooms or warehouses made fire-proof by copper shutters and a thick coating of clay are numerous in the cities, in which tradesmen keep their stock of goods, and private families their valuable effects, as pictures, books, &c. Fires are frequent, and from the combustible nature of the common buildings are often terribly destructive. Conflagrations consuming thousands of houses sometimes occur. Polygamy is not permitted, but the power of divorce on the part of the husband is limited only by the requisition that he shall provide in a suitable manner for the support of the repudiated wife; though in case she is divorced for barrenness, or for other reasons recognized by the tribunals as sufficient, she has no claim upon the husband for maintenance. Under no circumstances whatever can a wife demand to be separated from her husband. Concubinage and prostitution are permitted by law, and are not deemed particu-

larly disreputable. The courtesans are destined to their trade from infancy, and, being generally well educated and accomplished, are often selected as wives by respectable men. The most singular custom among the women is that of blackening their teeth and shaving or pulling out their eyebrows when they are married. Married women also tie their girdles before, and single women behind. The Japanese of all classes are remarkably cleanly in their houses and persons. They bathe frequently, and there are many public bath houses in the towns open to all comers for a fee generally equal to the 8th of a cent, where both sexes bathe together entirely nude, without apparently the slightest idea of impropriety. In warm weather persons of both sexes may be seen in the same primitive condition bathing themselves in large tubs before the doors of their houses. Suicide is very common, and is generally committed by cutting open the bowels by two gashes in the shape of a cross. It is tolerated, if not in some cases approved, by the laws. The criminal who thus anticipates execution secures the public sympathy and applause, saving his property from confiscation and his family from disgrace. Upon the death of superiors or masters suicide is often committed as a mark of personal devotion and attachment. It is also common as a means of escaping a disgrace or revenging an affront, where there appears to be no other resort. Titsingh, in his "Illustrations of Japan," says that all military men, servants of the emperor, and persons holding civil offices under the government, are bound, when they have committed any crime, to rip themselves up, though not till they have received an order from the court to that effect; for if they were to anticipate this order, their heirs would run the risk of being deprived of their places and property. No disgrace attaches to such a death, and the son succeeds to his father's place. "This practice is so common," says Titsingh, "that scarcely any notice is taken of such an event. The sons of all persons of quality exercise themselves in their youth, for 5 or 6 years, with a view that they may perform the operation, in case of need, with gracefulness and dexterity; and they take as much pains to acquire this accomplishment as youth among us to become elegant dancers or skilful horsemen; hence the profound contempt of death which they imbibe in their earliest years. This disregard of death, which they prefer to the slightest disgrace, extends to the very lowest classes among the Japanese." It is related, in illustration of this propensity to resort to suicide, that two high officers of the court met on the palace stairs and jostled each other. One was an irascible man, and immediately demanded satisfaction. The other, of a placable disposition, represented that the circumstance was accidental, and tendered an ample apology; remarking that no other satisfaction could reasonably be demanded. The irascible man, however, would not be appeased; and finding that he could not provoke

the other to a conflict, he suddenly drew up his robes, unsheathed his sword, and cut himself open in the prescribed mode. As a point of honor his adversary was under the necessity of following the example. Recent accounts state that the now fashionable mode of *harri karri*, or "happy despatch," as this practice of suicide is called, substitutes decapitation by the sword of a relative for the old method of ripping up. A recent English writer, Rundall, in his "Memorials of Japan," thus sums up the character of the Japanese: "They carry notions of honor to the verge of fanaticism; and they are haughty, vindictive, and licentious. On the other hand, brawlers, braggarts, and backbiters are held in the most supreme contempt. The slightest infraction of truth is punished with severity; they are open-hearted, hospitable, and, as friends, faithful to death. It is represented that there is no peril a Japanese will not encounter to serve a friend; that no torture will compel him to betray a trust; and that even the stranger who seeks aid will be protected to the last drop of his blood." St. Francis Xavier, after a long missionary experience of the Japanese, declared that in virtue and probity they surpassed all the nations he had ever seen, and the latest and most competent European and American observers bestow almost equally high praise upon the national character.—The agriculture of the Japanese is conducted with diligence and skill. With the exception of the roads, and of the woods required to supply timber and charcoal, hardly a foot of ground to the very tops of the mountains is left uncultivated. Irrigation is judiciously applied, and manure of all kinds is carefully collected and used in the production of generally abundant harvests. The grain principally raised is rice, which is said to be of very superior quality. Next to rice, the tea plant is the great object of cultivation. A coarse sugar is obtained from the sap of a tree. The gardeners of Japan have attained the art of dwarfing and also of unnaturally enlarging all vegetable productions. They exhibit in the miniature gardens of the towns full-grown trees of various kinds only 3 feet high, with heads of about the same diameter. A box was shown in 1826 to the president of the Dutch factory at Nagasaki, 4 inches long, 1½ wide, and 6 high, in which were growing a bamboo, a fir, and a plum tree, the latter in full blossom. The price asked for this portable grove was about \$500. The growth of trees is sometimes so stimulated that the branches stretch to a great distance from the trunk, and are supported on props.—The Japanese work admirably well in iron, silver, gold, and all metals. Manufactures are carried on in every part of the country, and some of them are brought to such a degree of perfection as to surpass those of any other part of the world. Their lacquering in wood excels that of all other nations. They work with great skill in *sovas*, a mixture of gold and copper, which they color blue or black in a manner unknown elsewhere. Their silk and

cotton goods are well made, and they understand the art of making glass in all its branches. Their steel swords are unapproachable in quality, and they make excellent mirrors of steel. Paper is made from the bark of the mulberry tree in great abundance and of remarkable strength; it is used not only for writing and printing, and for wrapping goods, but for handkerchiefs and napkins. They are skilful in carving and die-sinking, and in the casting of metal statues, which are extensively used for idols. Their iron works, tobacco factories, breweries, distilleries, and other manufacturing establishments, are frequently on a large scale, employing hundreds of workmen. The cities of Miako, Yeddo, and Osaka are the great seats of manufactures. At Miako are made damasks, satins, taffetas, and other silk fabrics of every kind, lacquered articles, caps, scarfs, screens, fans, pins, bow-strings, paints, tea boxes, grindstones, and porcelain and earthenware; at Osaka, cotton goods and iron ware; and at Yeddo nearly every species of manufacture is carried on. The people show the greatest eagerness and aptitude for imitating all kinds of European manufactures, and they are already well supplied with microscopes, telescopes, clocks, watches, knives, spoons, &c., of native make from European models, and sold at a very cheap rate. Iron and brass cannon in the European style are made, and bomb shells with the latest improvements. Colt's revolvers and Sharp's rifles are also made by native workmen, and at Nagasaki works have been established for the production of steam engines without European assistance, and a screw steamer built, which has been successfully navigated from Nagasaki to Yeddo in 9 days entirely by native seamen and engineers.—The internal trade of Japan is carried on with great activity. The roads are good and kept in excellent order, and stables, taverns, and warehouses are abundant for the accommodation of merchants and other travellers. Commercial operations are conducted with promptness and regularity, and sometimes on a most extensive scale. The president of the Dutch factory in Japan, who visited Yeddo in 1806, says in his narrative of the visit: "There is a silk mercer here named Itsigoya, who has shops in all the great towns throughout the empire. If you buy any thing of him here and take it away to another town, say to Nagasaki, and no longer like it, you may return it, if undamaged, to his shop there, and receive back the whole sum paid for it at Yeddo. The wealth of this man is astonishing. During my stay at Yeddo there occurred a tremendous fire, that laid every thing, our residence included, in ashes over an area of about 3 leagues by 1½. Itsigoya lost on this occasion, beside his shop, a warehouse containing upward of 100,000 lbs. weight of spun silk, which fell altogether upon himself, the Japanese knowing nothing of insurances. Notwithstanding this, he sent 40 of his servants to our assistance during the fire, who were of great use to us. The second day after the conflagration

he was already rebuilding his premises, paying every carpenter at the rate of about 10 shillings English a day." Goods are conveyed by land on pack horses and oxen. But the principal carriage of merchandise is by water, for though the peculiar construction of the Japanese vessels unfits them for long sea voyages, they are well enough adapted to the navigation of lakes and rivers, and for coasting from port to port, and crossing from island to island. The shores of the Japanese group afford great facilities for a coasting trade, from the abundance of harbors and of shelter for vessels of small size; and these facilities are energetically used by the people of the coasts, who keep afloat a vast number of vessels, from fishing boats to junks of 300 tons burden. Commerce is free from any impediments by tolls or duties, and the inland trade is promoted by great fairs, which from time to time are held at the city of Miako. Until a very recent date the foreign commerce of Japan, for more than two centuries past, was limited to the Chinese and the Dutch. The Chinese trade is confined to Nagasaki, where a few junks arrive annually from the ports of Amoy, Ningpo, and Shanghai. The Dutch were allowed to visit only the port of Nagasaki, where they had a factory on a small island called Desima, in which 12 or 13 merchants lived, closely watched by the Japanese, and allowed very little liberty. Two ships were annually sent from Batavia. Their cargoes consisted chiefly of sugar, ivory, tin, lead, bar iron, fine chintzes, broadcloths, shalloons, silks, cloves, tortoise shell, drugs, spectacles, looking glasses, watches, and various herbs and roots to which the Japanese ascribe medicinal virtues. The chief articles of export were coffee, camphor, lacquered goods, porcelain, and rice. In 1846 the imports of the Dutch into Japan amounted to only \$92,446, and the exports to \$220,927. In 1852, however, American diplomacy succeeded in removing the restrictions which had for centuries hampered the foreign intercourse with Japan, and many ports of the empire have since been opened to external commerce. The articles most in demand among the Japanese are tissues of all kinds, cotton prints, calicoes, flannels, camlets, small patterned chintz, velvets, woollen cloth, blankets, red shawls, glass ware, mirrors, drugs, ivory, muskets, and cheap clocks and watches. The most profitable exports thus far are provisions, which find a market in China, silk, camphor, vegetable oil and wax, lacquered ware, and copper. The chief obstacle to profitable trade since the opening of the ports has proved to be the peculiar ideas of the Japanese government on the subject of the currency. The money of Japan consists of a great variety of gold, silver, and copper coins. The largest gold coin is the obang, which is 6 inches in length and $3\frac{1}{2}$ in breadth, and is worth about \$100. It is not in common use. The largest gold coin in ordinary circulation is the cobang, which is $2\frac{1}{2}$ inches in length and $1\frac{1}{2}$ in breadth. It is worth about \$7.50. A still more common coin is the

itzibue, which when of gold is worth intrinsically about \$1.75. The silver itzibue is the common silver coin, and is worth about 20 cents. A new coin has been recently issued, called a nichon, which is worth about half a dollar. But foreign coins have not been allowed to circulate among the people at all, and foreigners have been compelled to exchange their own money for Japanese coins, at a valuation which has rendered it very difficult to carry on a profitable trade. Arrangements however have been recently made, which it is supposed will remedy these difficulties.—In science, the Japanese have particularly cultivated medicine, astronomy, and mathematics. Superstitious prejudices have prevented them from studying anatomy by dissection, and they therefore have little skill in surgery; but as physicians they succeed better, and are able to cope with the most difficult and dangerous diseases. The medical men who have visited Japan under the auspices of the Dutch speak favorably of the skill of the native physicians, and of late years the study of European books has led to a rapid improvement in the healing art. Among their inventions are acupuncture and moxa burning, both of which, though now superseded by other processes, were long practised in Europe, into which they had been introduced from Japan. Their most remarkable medical discovery, however, is that of a powder called *dosia*, which is reputed to possess great and beneficial power in child-bearing, for diseases of the eyes, and for other maladies. Taken in perfect health, it cheers the spirits and refreshes the body. But its most surprising effect is to restore a dead human body to as great a degree of flexibility as it had when living. It is introduced in small pinches into the ears, nostrils, and mouth of the deceased, and the corpse thus made flexible is placed in a tub, 3 feet high, $2\frac{1}{4}$ feet in diameter at the top, and 2 feet at the bottom. Tisingh, president of the Dutch factory for many years, and a man of intelligence and high character, declares that he himself witnessed this operation performed in Oct. 1783, on the body of a young Dutchman who had died in the factory at Desima: "I directed the physician to cause the body to be washed, and left all night exposed to the air on a table placed near an open window, in order that it might become completely stiff. Next morning several Japanese, some of the officers of our factory, and myself, went to examine the corpse, which was as hard as a piece of wood. One of the interpreters, named Zenby, drew from his bosom a pocket-book, and took out of it an oblong paper, filled with a coarse powder resembling sand. This was the famous *dosia* powder. He put a pinch into the ears, another pinch into the nostrils, and a third into the mouth; and presently, whether from the effect of this drug, or of some trick which I could not detect, the arms, which had before been crossed over the breast, dropped of themselves, and in less than 20 minutes by the watch the body recovered all its flexibility."

Chemistry is very imperfectly studied, but botany, at least so far as it is connected with the knowledge of simples, is successfully cultivated. In astronomy the Japanese have made considerable progress. Their astronomers are well acquainted with the best European treatises, which they study in Dutch or in translations from that language. They have excellent telescopes, chronometers, barometers, and thermometers of native workmanship; and good almanacs, including the calculation of eclipses, are annually published. In the fine arts they have made little progress. Their music is generally disagreeable to European ears, though the people themselves take a passionate delight in it. The use of the *sansie* or native guitar is an invariable part of female education. In the arts of design and painting they show some taste, though superstition prevents them from studying or accurately representing the human form. In portraits their attention is principally directed to accuracy in the details of costume, and to the general air. The face is never a likeness. Their delineations of flowers, fruits, and birds are exquisitely beautiful.—Paper began to be used in Japan as early as the 7th century, and printing from engraved wooden blocks in the Chinese manner was introduced about A. D. 1200. Printers and booksellers are numerous, and keep the market well supplied with cheap books, many of them profusely illustrated with woodcuts. Like the Chinese, they print only on one side of the paper. Miako is the chief seat of the book trade, and is eminently a literary city. The people throughout the empire are fond of reading, and education is universal. Public schools are maintained by a tax for the purpose; and by a law which is strictly enforced, every child must be sent to school and be instructed in reading, writing, and some knowledge of the history of the country. The literature of Japan comprises works of all kinds, histories, geographical and other scientific treatises, books on national history, voyages and travels, moral philosophy, dramas, romances, poems, dictionaries, and cyclopædias. A collection of the works of their poets, accompanied by short memoirs, has been made, and almost every Japanese is familiar with the best passages of the principal poets, and fond of quoting them in conversation. Many of their novels are said to be interesting, and to exhibit a higher imagination and more truth to nature than is found in the fictions of other oriental nations. Their dramas, of which the people are passionately fond, are generally founded on national history or tradition, or the exploits, lives, and adventures of Japanese heroes and gods. Some of them are designed to illustrate and enforce moral precepts. Their general tendency is said to be elevating, patriotic, and decorous, though some of them are strongly tainted with the national passion for revenge, and have horrible exhibitions of cruel punishments. The unities are totally disregarded, and the scene shifts from country to country and flies over

great spaces of time without much regard to probability. Only two actors are usually upon the stage at the same time, and the female parts are performed by boys, as was formerly the case in Europe. The actor is most esteemed who can most frequently change parts in the same piece, and the leading actors receive very high pay. In general, however, the profession is held in great contempt, and the actors have the reputation of being the most licentious and degraded class of the population.—There are many religions in Japan. The most recent account of them has been given by a writer in the "London Illustrated News" in Dec. 1858, and Jan. and March, 1859, who professes to speak from personal observation and from original authority. According to this writer, the ancient religion of the Japanese consisted in the worship of the sun and the elements. The sun is still adored under the form of a bright disk or mirror to be found in every temple of the Sinto sect. A curious ceremony practised by the old races in India, and inculcated in the Vedas, called *aswamed'ha*, and emblematic of the immolation of the horse, is still observed in Japan. The horse was anciently considered an emblem of the primeval and universal manifested being, and when this being was identified with the sun the horse became his attendant. We find traces of this belief in the Greek myth of Phaëton and his horses. In Japan Ten Zio Dai Zin, "he who darts out his rays," is honored in a peculiar manner by the presentation of a horse or its emblem at his temple. Every Sinto temple has numerous pictures of these sacred horses suspended on its walls. The sun, then, is the great object of religious veneration among the followers of the Sinto doctrine. The word *sinto* is equivalent to spirit worship. The Sinto belief supposes the existence of an infinite number of spirits, exercising an influence over the affairs of the world, who are to be propitiated by prayers and the observance of certain rules of conduct, by cleanliness of person and purity and cheerfulness of heart. The chief of these spirits is the sun, and after him the elements. These are called Dai Zin, "great spirits." The inferior spirits, who are very numerous, are chiefly heroes canonized for their worthy deeds or illustrious qualities. The most prominent and popular of these minor deities is Fatsman, the god of war, who is an apotheosis of the 16th emperor of Japan. He is supposed to have been born in a supernatural manner, and is universally honored throughout the empire. A Sinto temple is called a *mya*, which means royal residence or palace. Hence the name of the city Miako (Myako), which is the abode of the spiritual emperor, who is regarded as a living god, an incarnate deity. The worship paid to the spirits residing in the *nyas* is of a very simple character. The devotee approaches the *mya* under the sacred gateways until within a short distance of the door. He then stops, flings a few coins through an aperture, folds his hands in the posture of reverence, mutters his prayers, and departs. The Sinto

priests are called *kanusi*, which signifies "spiritual teachers." They do not form a caste, and have no ordination, no special privileges, or peculiar costume. They are looked upon, however, as one of the highest classes in society. The Sinto religion, the ancient faith of Japan, has been to a great extent supplanted by Buddhism, which has a tendency to absorb a popular belief where it cannot wholly overpower it. It has appropriated many of the Sinto doctrines, and has become so mixed with Sintoism that the ancient religion has lost much of its distinctive character, and images and Buddhist modes of worship have been introduced into many of its temples. In Japan, Buddha is worshipped either as Niu Rai or as Amida. Niu Rai is a corruption of the Chinese term *gu soi*, which means literally "thus gone," a contraction of the sentence: "He who has come, perfected his doctrine, and gone for ever." The personage referred to is Gaudama. Amida is a contraction of the Sanscrit Amitabha, a fabulous Buddha supposed to preside over the west, but originally a personification of the element air. The worship of this deity in Japan seems to consist chiefly in the repetition of the phrase *Namouda*, that is, *Namoo Amida*, "All honor to Amida." Next to the worship of Niu Rai and Amida is that of Kanon, the goddess of mercy. She is exceedingly honored by the Japanese, and images of her are seen everywhere. She is represented as "one possessing a merciful and compassionate heart," and is therefore always addressed by those in affliction as their patron or friend. She is called the "mother of God," and it is supposed by some European scholars that her worship originated in an idea of the Virgin Mary carried at an early age from the west through India and China to Japan. Next in order among the Buddhist deities of Japan is Dzizo. He presides over the 10 judges of the infernal regions, of whom Jemma is the chief. He is described as possessing a clement disposition, desirous of rescuing mortals from the consequences of sin. His image is placed at the head of graves. Inferior to these are the deities or saints called Rankan, whose images, 16 in number, are to be found in almost all the temples. There is beside a very popular deity whose image is to be found in nearly every house; this is Dai Gak, "the great black one," the god of riches. He is represented as a little man with a very large sack on his shoulders, and sometimes with a hammer in his hand. His proper place is the kitchen, and he is usually to be seen enshrined there near the hearth. Buddhism is the most popular of the Japanese religions. Its priests are called bonzes, and are numerous and respected. There is, however, a large body of Japanese who reject idol worship entirely, and found their rule of life on mere philosophical and abstract notions. They are followers of Confucius, and form a sect known as Siuto or the school of philosophers, which includes the people of the best education. In Japan, however, the term sect

scarcely applies. There is no hostility between the different forms of religion, and in a certain sense the Sintoist, the Buddhist, and the Confucian all profess the same religion. They differ in modes, but agree in essentials. Those who profess one mode do not thereby condemn the other. The followers of Siuto have no temples or ritual; they pay supreme homage to Confucius, and religiously venerate their ancestors. Intimately connected with Buddhism are the doctrines of Lao-Tze, whose followers are called Yamabusi, "hermits." They pretend to magical art, and frequent the recesses of mountains and craggy steeps, whence they come forth to tell fortunes, write charms, and sell amulets. They lead a mysterious life, and admit no one to their secrets except after a tedious and difficult preparation by fasting and a species of severe gymnastic exercises. All sects seem to be tolerated by the government, and to live in harmony with each other. The authorities of the state appear to be indifferent to mere doctrines, so long as the public tranquillity is not disturbed. Soon after the first introduction of Christianity in the 16th century, some of the heathen priests petitioned the emperor Nobun-anga to prohibit the new and foreign faith. The emperor asked them how many different religions there were in Japan? He was told there were 35; upon which he remarked: "Where 35 religions are tolerated we can easily bear with 36; leave the strangers in peace." Meylan, a Dutch official who resided for several years at Nagasaki, says in his "Sketches of the Manners and Customs of Japan": "Never do we hear of any religious dispute among the Japanese, much less discover that they bear each other any hate on religious grounds. They esteem it, on the contrary, an act of courtesy to visit from time to time each other's gods, and do them reverence. While the koboo sends an embassy to the Sinto temple at Isye, to offer prayers in his name, he assigns at the same time a sum for the erection of temples to Confucius; and the spiritual emperor allows strange gods, imported from Siam or China, to be placed, for the convenience of those who may feel a call to worship them, in the same temples with the Japanese. If it be asked whence this tolerance originates, and by what it is maintained, I reply from this, that worshippers of all persuasions in Japan acknowledge and obey one superior, namely, the daïri or spiritual emperor. As the representative and lineal descendant of God on earth, he is himself an object of worship, and as such he protects equally all whose object it is to venerate the Deity, the mode of their doing so being indifferent to him."—The most remarkable feature of the religion as well as the government of Japan is the existence of the spiritual emperor, sometimes called the daïri, but whose proper title is the mikado, daïri meaning court or palace, and when applied to the mikado it is an abbreviation of daïri-sana, or lord of the palace. He is the embodiment of the idea of an absolute, divinely commissioned sovereign, the

vicegerent of God on earth, and his office seems to be similar to that of the Dalai Lama or Grand Lama of Thibet. He claims descent from Sin-Mu, who about 660 B. C. first established a regular government in Japan. There has been no recent account of the mikado, and to this day the work of Kämpfer, published in 1728, is the chief source of our knowledge of this spiritual sovereign, as it is on almost all Japanese matters. According to Kämpfer, the mikado is considered so holy that he is not allowed to touch the ground with his feet, but when he goes anywhere is carried on men's shoulders.

"Much less will they suffer that he should expose his sacred person to the open air; and the sun is not thought worthy to shine on his head. There is such a holiness ascribed to all parts of the body, that he dares to cut off neither his hair, nor his beard, nor his nails. However, lest he should grow too dirty, they may clean him in the night when he is asleep; because they say that what is taken from his body at that time hath been stolen from him, and that such a theft does not prejudice his holiness or dignity. In ancient times he was obliged to sit on the throne for some hours every morning with the imperial crown on his head, but to sit altogether like a statue, without stirring either hands or feet, head or eyes, nor indeed any part of his body, because by this means it was thought that he could preserve peace and tranquillity in his empire; for if, unfortunately, he turned himself on one side or the other, or if he looked a good while toward any part of his dominions, it was apprehended that war, famine, fire, or some other great misfortune was near at hand to desolate the country. But it having been afterward discovered that the imperial crown was the palladium which, by its immobility, could preserve peace in the empire, it was thought expedient to deliver his imperial person, consecrated only to idleness and pleasure, from this burdensome duty, and therefore the crown alone is at present placed on the throne for several hours every morning. His victuals must be dressed every time in new pots, and served at table in new dishes; both are very clean and neat, but made only of common clay, that, without any considerable expense, they may be laid aside or broken after they have served once. They are generally broken for fear they should come into the hands of laymen; for they believe religiously that if any layman should presume to eat his food out of those sacred dishes, it would swell and inflame his mouth and throat. The like ill effect is dreaded from the daira's sacred habits; for they believe that if a layman should wear them without the emperor's express leave or command, they would occasion pains in all parts of his body." The mikado, though nominally the supreme ruler of Japan, has in reality no political power at all. He has no revenues except those of the small principality of which Miako is the centre, and an annual present of no great amount from the tycoon or tem-

poral emperor. According to recent Dutch writers, the court of the mikado is very poor, and his dependents are obliged to practise a variety of arts in order to get their living.—The civil government of Japan is conducted under a system of ancient laws which are administered with rigor and adhered to with singular tenacity. No individual in the whole empire, however elevated in rank, is above the law, and those who comply with legal requisitions do not seem to have any reason to dread arbitrary power or capricious tyranny. The actual government, though nominally in the hands of the tycoon at Yeddo, is in fact conducted by a council of state, composed of 5 members of the highest and oldest nobility, appointed by the tycoon, and assisted by a minor council of 8 nobles. Under these in regular and very numerous grades are functionaries of all kinds, from ministers of state down to police officers. The imperial crown descends to the eldest son of the tycoon. There are also in the empire several hundred hereditary princes who are vassals of the tycoon, but are nominally sovereigns within their own dominions. These great feudatories, however, who are the descendants of ancient independent princes, are closely watched by the imperial council of state, by means of spies and informers; and the administration of every principality is really conducted, not by the prince himself or by ministers of his own choice, but by two secretaries appointed by the supreme council, one of whom resides in the principality and the other at Yeddo, where the family of the absent secretary is detained as a hostage for his fidelity. As a further check upon the vassal princes, each of them is compelled to reside during every alternate year or half year at Yeddo, and they are kept from accumulating much treasure by having heavy contributions levied upon them. They are so harassed by surveillance and restraint that they generally seek relief in abdication of their troublesome dignities as soon as they have sons of proper age to succeed them, so that a reigning prince advanced in years is rarely seen in Japan. Every Japanese head of a family is personally responsible for the conduct of his children, servants, and guests, and the whole population is divided into groups of 5 families, every member of which is responsible for the conduct of the others. No one can change his residence without obtaining a certificate of good conduct from the neighbors he is about to leave, and permission from those among whom he wishes to go. The result of this organization is that a criminal has no hiding place, and consequently very few robberies or other crimes are committed. The Japanese people are divided into 8 hereditary classes, and each person commonly remains through life in the class in which he is born, though sometimes men are exalted into higher classes by ability or force of character. These classes are: 1, the vassal princes; 2, the nobles under the rank of princes, from whom the officers of state, governors, generals, and other high officials are

selected; 3, the priests of all sects; 4, the soldiers; 5, physicians, government clerks, scribes, and subordinate employees of the government generally; 6, the principal merchants and shopkeepers; 7, retail dealers, petty shopkeepers, mechanics, artisans, and artists; 8, the peasantry and day laborers of all kinds. The first 4 classes constitute the higher orders of Japanese society, and have the privilege of carrying two swords and of wearing a sort of loose petticoat trousers. Below the last named class there is another, so low that it is not ranked at all among the orders of society, nor even enumerated in the census which is taken at regular intervals. These are the tanners, curriers, leather cutters, and in short everybody connected in any way with leather. They are the pariahs of Japan, and are compelled to live in detached villages, the space occupied by which is not taken into account in measuring distances on the public roads. A standing army is maintained by the imperial government, amounting, according to the Dutch authorities, to 100,000 foot and 20,000 horse. Each of the vassal princes also maintains a military force, more or less numerous according to the extent of his domains. These troops are badly disciplined, and know little of the art of war as it is understood by Europeans. Their gunnery is unskilful, though they have immense numbers of excellent cannon, and matchlocks and even bows and arrows are still used by the soldiers. Their recent more extensive intercourse with other nations has, however, led to a change in this respect, and they appear to be adopting the latest improvements in fire-arms. The military profession is held in the highest esteem, even the private soldier wearing two swords in token of nobility, and receiving from the trading and laboring classes the title of *sama* or "my lord." The Japanese laws are very severe, death being in theory the punishment for almost every offence, though in practice imprisonment and flogging are often substituted. The noble and the peasant, the rich and the poor, are punished alike, fines and bail being unknown in Japan. The laws consist of simple and intelligible edicts issued from time to time in the name of the tycoon, printed copies of which are hung up in public places. There are no lawyers, every man conducting his own case before the magistrate, who gives a summary decision which is executed without delay. Cases of great importance are referred to the chief justice at Miako or to the imperial council at Yeddo. Justice is said to be administered with great purity and with much decorum and solemnity.—The history of Japan, like that of other ancient nations, begins with a mythical period, during which gods and goddesses mingled openly in the affairs of men. The authentic annals of the country commence with the reign of Sin Mu, who was at the same time high priest and emperor, about 660 B. C. He is said to have civilized the people, and to have established laws and a settled government. For

many centuries his posterity reigned on the throne he had founded, bearing the title of mikado, and claiming to rule by divine right and inheritance. They were worshipped as gods upon earth, and long exercised the most absolute power. Women were not excluded from the succession, and in ancient Japanese history there are many famous empresses. The most celebrated of these was the empress Singokogu, who began her reign in the 3d century of the Christian era. She conquered Corea, and gave birth to a son who succeeded her, and who was so successful and renowned that at his death he was deified, and is now the Japanese god of war. In this early period a free intercourse appears to have been carried on with China, from which country about the middle of the 6th century Buddhism entered Japan, and was extensively spread among the people. Toward the end of the 7th century the claims of two brothers to the throne led to a great civil war, which was ended by the defeat and suicide of the younger. About the end of the 8th century a foreign people, of whom nothing more is known than that they were not Chinese, but natives of some more distant country, invaded Japan, and being constantly reënforced from home, maintained hostilities for 18 years before they were entirely expelled. Between the 9th and 12th centuries several new religions were introduced by foreign priests or by Japanese returning from foreign countries. The reign of the emperor Itsi Sio (987–1012) was remarkable for a great epidemic over the whole country, and for the number of learned men who adorned the court. In the reign of Go Rei Sen (1046–'69) a great rebellion took place in the province of Osju, which lasted for 5 years, and is much celebrated in Japanese literature. Another famous rebellion was headed by Kijomori, a prince of the blood, in the reign of To Ba (1108–'24). About the middle of the 12th century, during the reign of the emperor Kon Jei, the authority of the mikado began to decline. The vassal princes took advantage of the weakness of the imperial government to strengthen their own power, and great confusion ensued. To remedy these evils, the court of the mikado created the office of siogun or commander-in-chief of the army, and appointed to the post Joritomo, one of the most celebrated characters in Japanese history. He was a young soldier of high birth, related to the imperial family, and was successful and ambitious, so that after quelling the turbulence of the great vassals and restoring the authority of the crown, he contrived to concentrate in his own hands the real power of the government, without, however, depriving the mikado of his nominal rank, dignity, and religious supremacy. The office of siogun was made hereditary in the family of Joritomo, whose descendants became in fact joint emperors with the mikado. The Mongols having invaded China in 1260 and conquered the greater part of it, their leader Kublai Khan sent envoys to Japan in 1268, and again in 1271 and

1273, summoning the Japanese government to enter into an alliance with him. The Japanese dismissed the envoys without any answer. The Mongol conqueror, irritated at their insulting indifference to his proposals, sent against them a great fleet and army in 1274, or according to Marco Polo in 1264. This expedition landed in Japan, but was defeated and the army cut to pieces. A still greater expedition was despatched in 1281, and met a similar end, the Japanese sparing only 3 of the invaders to carry back to China the news of the fate of the rest. Japan from that time to the present has not been molested by invaders. In the 16th century civil wars broke out, and a revolution took place, by which Faxiba, a man of extraordinary ability and energy, originally a private soldier, was raised to the supreme command, and became siogun, under the name of Taiko Sama or Lord Taiko, with the additional title of tycoon, which is now the appellation commonly given to the emperor at Yeddo, or lay emperor. He was the first secular monarch who assumed entirely the absolute control of the empire, some share in the government having been hitherto granted to the mikado, who was now reduced to the condition of a merely nominal monarch. Taiko Sama is regarded by the Japanese as the greatest character in their history, at least since the mythical period, and was eminent not only as a warrior and statesman but as a legislator. His laws and policy are to this day observed by the government of Japan, and have secured to the nation an almost unequalled permanence of peace and prosperity. The turbulence of the vassal princes, who were then only 60 in number, and were consequently individually powerful, was the chief source of the troubles that had afflicted the empire, and Taiko Sama took the decisive step of reducing their forces by dividing each principality into several. This policy, steadfastly carried out by him and his successors, has resulted in establishing 604 distinct principalities and lordships, none of which are of sufficient magnitude to be formidable to the imperial power. It was during the confusion that preceded the rise of Taiko Sama that the Europeans began to be connected with the affairs of Japan. The existence of that empire was first made known to Europeans by the Venetian traveller Marco Polo, who in his narrative, written about 1298, mentions it under the name of Zipangu, a modification of the Shippen-kue of the Chinese, from whom he had obtained his information. He says: "Its inhabitants have fair complexions, are well made, and are civilized in their manners. Their religion is the worship of idols. They are independent of any foreign power, and governed only by their own kings. They have gold in the greatest abundance, its sources being inexhaustible; but as the king does not allow of its being exported, few merchants visit the country, nor is it frequented by much shipping from other parts." The Portuguese, after Vasco da Gama had

doubled the cape of Good Hope in 1497, rapidly extended their discoveries and conquests in southern Asia. In 1542, 3 Portuguese sailors, who had deserted their ship and taken possession of a Chinese junk, were driven by storms upon the coast of Japan, and to them is ascribed its European discovery. About 3 years later a Portuguese adventurer, Fernam Mendez Pinto (whose name was for a long period a synonyme for liar, but whose veracity has been reestablished by modern criticism), while cruising with some companions of his own nation in the vessel of a Chinese pirate, was driven by foul weather into a harbor in one of the smaller Japan islands. He was well received, and carried back to the Portuguese settlements in China such a report of the riches and magnificence of Japan that great numbers of traders and adventurers flocked thither, and an active commerce soon sprang up. Missionaries speedily followed the merchants, and in 1549 Japan was visited by the celebrated "apostle of the Indies," St. Francis Xavier. Both merchants and missionaries were favorably received, and while the one class found a ready and most profitable market for their goods, the other rapidly converted vast numbers of the natives to Christianity. Three of the most powerful of the Japanese nobles, the princes of Bungo, Avima, and Omura, were among the converts. In 1582 the Japanese Christians sent an embassy with letters and presents to Rome to do honor to the pope, and assure him of their submission to the church. In the two years which followed their return (1591-2) it is said that 12,000 Japanese were converted and baptized. Tempted by the success of the Portuguese, the Dutch East India company in 1598 despatched 5 merchant vessels to Japan, one of which reached it in 1600. In 1609 other Dutch ships arrived, and were well received by the Japanese, who conceded to them the port of Firando for a factory or settlement, with considerable privileges. Before the arrival of the Dutch, who were then at war with Portugal, the Japanese government had become distrustful of the Portuguese, whose astonishing success made them haughty and disdainful of the feelings and prejudices of the natives. Portugal was at that time united with Spain, and a Spaniard, when asked by Taiko Sama: "How is it that your king has managed to possess himself of half the world?" indiscreetly answered: "He sends priests to win the people; his troops then are sent to join the native Christians, and the conquest is easy." This answer, it is said, made a deep impression on the Japanese government. In 1587 Taiko issued an edict for the banishment of the missionaries; the edict was renewed by his successor in 1596, and in 1597 23 priests were put to death in one day at Nagasaki. The Christians on their part took no measures to pacify the government, but defied it, and began to overthrow idols and pull down heathen temples. This led to dreadful persecutions in 1612 and 1614, when many of the Japanese converts were put to death, their

churches and schools destroyed, and their faith declared infamous and rebellious. The Portuguese traders were no longer allowed free access to the country, but were confined to the island of Desima at Nagasaki. In 1622 a frightful massacre of native Christians took place in the neighborhood of Nagasaki, and horrible tortures endured with heroic constancy were inflicted on multitudes in the vain effort to make them recant. In 1637 it was discovered by the Japanese government that the native Christians, driven to despair by persecution, had entered into a conspiracy with the Portuguese and Spaniards to overthrow the imperial throne. The persecutions were renewed with increased rigor. Edicts were issued banishing the Portuguese for ever from Japan, and prohibiting any Japanese, or any Japanese ship or boat, from quitting the country under the severest penalties. By the close of 1639 the Portuguese were entirely expelled, and their trade transferred to the Dutch, who, as enemies to the Portuguese and to the Roman Catholic faith, were not involved by the Japanese in their condemnation. In 1640 the oppressed native Christians rose in open rebellion in the province of Simabara. They seized a fortified place, made a long and gallant stand against the imperial troops, and were at length subdued only by the artillery and military science of the Dutch, who were either persuaded or compelled by the Japanese to cooperate against the rebels. The Christian stronghold was finally carried by storm, and all within its walls, men, women, and children, to the number of many thousands, put to death. In the next year the Dutch were ordered to quit their factory at Firando, and take up their residence, under very rigid inspection, in the island of Desima at Nagasaki. There they remained for more than two centuries in undisturbed monopoly of the entire European trade of Japan, notwithstanding occasional efforts of the Russians and English to obtain intercourse with the secluded empire. These efforts were resolutely repulsed, and led in one case to the imprisonment for two years in Japan of the Russian captain Golownin and several of his companions. In 1852 the United States government, in consequence of complaints made to it that American seamen wrecked on the coast of Japan had been harshly treated by the authorities of that country, despatched an expedition under the command of Commodore M. C. Perry, who was instructed to demand protection for American seamen and ships wrecked on the coast, and to negotiate if possible a treaty by which American vessels should be allowed to enter one or more ports to obtain supplies and for purposes of trade. In Feb. 1854, Commodore Perry, with a squadron of 7 ships of war, entered the bay of Yeddo and came to anchor within a few miles of that capital. During the previous year he had entered the same bay and delivered to the Japanese a letter to the emperor from the president of the United States. On March 31, 1854, after much difficult nego-

tiation, a treaty was agreed upon, dated at Kanagawa, the nearest large town, though really signed at the village of Yokohama. By this treaty the ports of Simoda and Hakodadi were appointed for the reception of American ships, where they can be supplied with wood, water, provision, coal, and other requisite articles, and protection and assistance were guaranteed to shipwrecked seamen. Liberty to trade under certain restrictions was also granted, and an arrangement made for the residence of American consuls at Simoda and Hakodadi. In Sept. 1854, a British squadron commanded by Rear-Admiral Sir James Stirling entered the harbor of Nagasaki, and a treaty was soon concluded between Great Britain and Japan, by which Nagasaki and Hakodadi were opened to foreign commerce. Subsequently the Russians made a similar treaty and obtained equal privileges; and by a treaty dated Nov. 9, 1855, the Dutch in Japan were relieved from most of the restrictions so long imposed upon them at Desima. On June 17, 1857, a new treaty was negotiated at Simoda with the Japanese government on behalf of the United States by Mr. Townsend Harris, U. S. consul-general for Japan, by which the port of Nagasaki, in addition to those of Simoda and Hakodadi, was opened to American trade, and additional privileges granted to American merchants. In 1858 Mr. Harris succeeded in reaching Yeddo, where he concluded a still more favorable treaty. In the same year a British squadron conveyed a British ambassador, the earl of Elgin, to Yeddo, where, on Aug. 26, a new treaty was concluded between Great Britain and Japan, by which the ports of Hakodadi, Kanagawa, and Nagasaki were opened to British subjects after July 1, 1859, Nee-gata or some other convenient port on the W. coast of Nippon after Jan. 1, 1860, and Hiogo after Jan. 1, 1863, and various commercial privileges granted to British merchants. About the time of the conclusion of this treaty the reigning tycoon of Japan died of epilepsy at the age of 36. He was succeeded by his son, the present emperor, who is said to be a young man of great intelligence and of liberal political and commercial opinions. The latest intelligence from Japan states that a magnificent embassy from the emperor to the government of the United States was to embark at Yeddo on Feb. 22, 1860.—The principal writers on Japan are: Kämpfer, "History of Japan" (2 vols. fol., London, 1727); Golownin, "Memoirs of Captivity in Japan," translated from the Russian (3 vols. 8vo., London, 1824); Meylan, *Japan, voorgesteld in schetsen* (Amsterdam, 1830); Doeff, *Herinneringen uit Japan* (Haarlem, 1833); Titsingh, *Annales des empereurs de Japon* (Paris, 1834); Siebold, *Nippon* (20 vols., Leyden, 1832-'51); Mrs. Busk, "Manners and Customs of the Japanese," compiled and translated from Siebold and other Dutch authorities (London and New York, 1841); Charles MacFarlane, "Japan" (London and New York, 1852); Richard Hildreth, "Japan as It Was and Is" (Boston, 1855);

Francis Hawks, "Narrative of the Japan Expedition" (3 vols. 4to., Washington, 1856); Capt. Sherard Osborn, "A Cruise in Japanese Waters" (Edinburgh, 1859); Lawrence Oliphant, "Narrative of Lord Elgin's Embassy to China and Japan" (2 vols., London, 1859).

JAPAN, LANGUAGE OF. Though the Japanese are of a Mongolic type, and though their language is grammatically analogous both to those of the Mongolo-Tartaric and Mantchutungusic families, it differs radically from them. Its claim to be akin to the Chinese is invalidated by the essential characteristics of the Nipponese tongue, which differs from the Chinese as to the etymic import of its elements and in its polysyllabism. The genuine portion of the former is called *Yomi*, while the Chinese superfetation goes under the name of *Koye*. This may clearly be accounted for by Chinese settlements in Japan in the 3d century B. C., and by the prolonged intercourse with China, to which Japan owes its civilization and graphic systems. Siebold endeavors to establish genetic connections of the Japanese with various other languages, as for instance with that of the Ainos inhabiting the N. part of the island of Yesso and the S. point of Saghalien (Tarakai); with that in Santam on the coast of Manchuria, S. of the Amoor; with those of the Incas of Peru and the Bochicas of New Granada; with that of the Muisecas of Brazil, &c. Although the Korean languages have many features in common with the Japanese, their divergence is radical; and Klaproth's opinion that the Japanese is a tongue *sui generis* has not yet been refuted. The area of the Japanese comprehends the three great islands with some parts of Yesso and other southern Kuriles, of S. Saghalien, and also the Loo Choo (Lien-Khien) group of islands, where a dialect or closely related language is spoken. The vernacular idiom differs remarkably from the written, by peculiar terminations, particles, and construction. The written language has also a peculiar style, named *naiden*, for religious and mystical subjects, and another, called *gheden*, for profane composition. There are also two styles of allocation, the one of etiquette, the other vulgar. The speech of women also differs in some particulars from that of men. The Yomi is sonorous, soft, and agreeable; almost all words end in vowels, which, however, are often dropped, and in *m* and *n*. Some sounds are of difficult pronunciation to us. A too soft utterance of consonants produces vagueness between the sounds of *p*, *b*, *f*, and *v*; between *s* and the English *z*, *sh* and the French *j*. Although there are no decided *h* and *l*, some Europeans fancy they hear them, while better phonetic authorities credibly assert that they are really *f* and *r* respectively. The initial *r* sounds almost like *dr*. The number of original vocables is inconsiderable. Technical terms are generally Chinese, and often much altered. —There are two graphic systems. I. Sinography, somewhat modified. At the request of Ōzinteno, the 16th Daïri, Kieu-su-wang (Jap.

Kosuvu), king of Po-tsi (Takusai, in Corea), sent Wang-jin (Jap. Vonin), in A. D. 285, to Japan, to introduce there the *Tshin-tsé* (Jap. *Sinzi*, China letters), which were afterward named *Han-tsé* (Jap. *Kanzé*). From that time both the *Tshin-tsé* and the Chinese language became common in Japan; although the former are peculiarly pronounced, as may be seen in the examples within parentheses below. This divergence is, however, scarcely greater than that of the Chinese dialects from the Mandarin idiom. The sinograms of the learned are called *Taf* and *Soo*. With the varieties of sounds there are about 380 Japanized sinograms, beside the unaltered *Tshin-tsé*. The former are explained by the *Kata-kana* (see below); thus: *kekko*, beautiful, by the Jap. *birei*; *mei-jit* (celebrated pencil), fine writing, by *nō-zio*, &c. Sinograms are sometimes pronounced very differently from their proper sounds; thus: *ye* (the 27th Chinese syllable), river, from the sinographic *sin-kiang*; *me* (17th Chinese syllable), woman, sinogr. *niü*. Synonyms are often written with the same sinograms. Prefaces of books are commonly written in sinograms. II. As these did not altogether suit the peculiarities of Japanese phonetism and grammar, Kibi or Kibi-ko (733), who had been educated in China, selected 47 sinograms, and simplified them into syllabic signs, in analogy with their original sounds. This syllabary was named *I-ro-fu*, from the first 3 syllables, just as our alphabet is named from the first 2 letters. This *I-ro-fu*, surnamed *Kata-kana* (half letters or signs), is used collaterally with sinograms, explaining their sounds, and serving beside for the indication of grammatical particles; in the same manner as the Mantchu interlinear or marginal letters serve in Chinese texts. This form is called sometimes the writing of men. The 2d Irofa, surnamed *Fira-kana* (expanded letters), was contrived by the celebrated bonzes Comiu and Kobo (774–835), and became so manifold by the licenses of the pencil as to be almost illegible, especially owing to additions by a third bonze, Ziakuso, who added a 48th sign for a nasal sound. This is the cursive writing for daily transactions, sometimes called the writing of women. The 3d Irofa is *Mun-yo-kana* (myriad-leaves-letters, so called from the poem *Mun-yo-sio* by Tatsi-bana-no Moroye, about the middle of the 8th century, containing 10,000 verses), and is almost a sinogrammatic prototype of all the Irofes. The 4th is the *Yamato-kana*, a simple cursive script, which is used promiscuously with all the others. The original idea of the Irofa is Buddhistic and Indian. The varieties of form in all the Irofes are a great impediment to expeditious reading, the difficulty of which is increased by the many ligatures between the letters. Writing and reading proceed in vertical columns downward and from right to left. There are also some other diacritic as well as punctuating signs. The former are two, viz.: the *nigori*, which is almost like our quotation mark ("), and indicates that the hard or rough sound of a let-

ter is mollified, so as to cause the *ko*, *fō*, *to*, &c., to be pronounced *go*, *bo*, *do*; and the *maru* (°), which indicates tenuification, or hardening, for instance of *fō* into *po*. The marks of punctuation denote also the transposition, repetition, &c., of syllables; they also separate sinograms from Irofas. The order of syllables is as follows: *i*, *ro*, *fū*, *nī*, *fō*, *fe*, *to*, and so on, without any symmetry or analogy. Properly classed, they are: the 5 Latin vowels, *a*, *e*, *i*, *o*, *u*; the labial *f* with these vowels suffixed (*fū*, *fe*, *fī*, *fō*, *fū*); the guttural *k* with the same; the *m* with them; then the *s* with them (and modified by diacritics into *z*, French *j*, Eng. *sh*); then *y*, *t*, *r*, *n*, all with those vowels attached; lastly, two more, *n'a*, *n'e*. The *t* is sometimes *ts*, *dz*, &c. The transcription by Europeans is variable. There is, beside, a kind of metaphony, by which *fō* becomes *fū* and *fufū*; *viō*, *riyau*; *kvo*, *kavau*, *kafau*, &c. This is similar to the Latin *lavo*, *lavatum* and *lautum*, *lotum*; *faceo*, *fautum*, *fotum*, *fætus*, &c. Dialectic variations depend chiefly on modifications of sounds; in Yeddo, for instance, *r* predominates; elsewhere *f* is pronounced *v*; *fū* like *u*, &c.—In the grammar, there is no gender; the male sex is indicated by *ro*, the female by *me*. Substantives do not differ on the whole from adjectives. The latter are often replaced by qualitative verbs or by the particle of the genitive, and are euphonically varied, according to their position; thus, for instance: *akae fana*, red flower; *akashe fanava*, red is flower-the; *akoro naru*, red becomes it (as in Magyar *rővörösé lesz*); *aka irono fana*, Lat. *rubri coloris flos*. There is no proper article, but the suffix *ra* sometimes determines the acceptance, or shows the French *partitif*; and *syā* signifies "as regards." Cases are indicated by suffixes, as in the following example: *sten*, or *sten-ra*, Lat. *cælum*; *sten-no* (oftener *sten-ga*, as in Corean), *cæli*; *sten-ni*, *cælo*, versus and *ad cælum*; *sten-ye*, in *cælum*; *sten-ro*, *cælum*, accusative (also *sten-roba*); *sten-de*, *cælo*, ablative; *sten-yori*, *ex cælo*; *sten-kara*, *de cælo*, *per cælum*, &c. The plural is formed by suffixes, as *tatsi domo*, *ra syo*, which signify all, much, many; or by reduplication, as *fito-bito*, men, from *fito*, man, with altered initial. The genitive precedes: *fitono yomi*, Lat. *virī arcus*; *anagono fana*, *mulieris flos*. The numerals are various. We give here the Koye in the first place, and within parentheses the Yomi or common ones first, and after them those of days, viz.: 1, *itsi* (*fitots*, *tuitats*); 2, *ni* (*foats*, *futska*); 3, *san* (*mits*, *mika*); 4, *si* (*yots*, *yokka*); 5, *go* (*itsots*, *itska*); 6, *vok* (*mots*, *muika*); 7, *sitsi* (*nanats*, *nanuka*); 8, *fats* (*yats*, *yōka*); 9, *kō* (*kokonots*, *kokonoka*); 10, *yo* (*toro*, *toroka*), &c. The other Koye are: 11, *zyo-itsi* (10+1); 12, *zyo-ni* (10+2), &c.; 20, *ni-zyo* (2×10); 30, *san-zyo* (3×10), &c.; 100, *fyak* and 1,000, *sen*; 10,000, *man*; 100,000, *vok* (and *raksya*, Sanscrit *laksha*, a lac); 1,000,000, *teō*; 10,000,000, *kei* (*kotsi*, Sanscrit *kōti*). There are 3 sets of figures of numbers. Many particular words are also used in the sense of numerals, as in Chinese.—Of

pronouns, those of the 1st and 2d person seem to have been lost in the words of etiquette. I, to equals and inferiors, is *rasi*, to a superior, *ra-takusi*; we, to equals or inferiors, *rasi-domo*, to superiors, *ratakusi-domo*. There are more than 12 ceremonious quasi-pronouns for the 2d person. The 3d is *ano fito*, this man, &c. (as in Corean; see CHINESE, vol. v. p. 124). There are many demonstratives. Relatives are wanting, being supplied by participles or understood from the context of the phrases, thus: *vasino miru sto*, Lat. *mei (mihi) visus vir, for vir quem vidi*; but *rasiro viru sto, me videns vir, for vir qui me vidit*.—The verb is the most perfect part of Japanese speech. *Aru* (to be, or to act), united with nouns, produces many compound verbs. It is affected by many moods, voices, and other logical categories, as in the Altai-Uralic and in many American languages; as for instance: *tata-ku*, Lat. *fer-ire, percut-ere*; *tata-keru*, *ferire posse*; *tata-kerareru*, *percuti jubere*; *tata-eteoru*, *percutientem esse*; *tata-kau*, *se mutuo ferire, pugnare*; *tata-sashercau*, *facere ut inter se pugnent, bellum ciere*, &c., to a greater extent than the Semitic *kal*, *piel*, *nifal*, *hifil*, *hithpael*. The suffixes of the tenses are: present *ru*, past *ta*, future *o*; of negation, *nu*, *zu*. Persons and the plural are indicated by pronouns. The theme of the verb, which is also a substantive noun, is employed without alteration if others follow, and receives the suffixes only when it is not followed by others, or when it is the last word in the phrase. Various euphonic modifications take place in such a combination with the suffixes. Certain particles denote the moods. The participle is of very extensive application, rivaling that of the Greek. Adverbs are like adjectives, as in certain German phrases. The syntax adheres to a strict order, which is: first the subject (nominative), then the object, attributes, the verb, and the conjunction last.—Many of the simple words abound in significations, which must be discriminated by sinograms. Compounds and derivatives are as frequent and easy as in Greek or German. Examples of the former are: *kara-mi*, Lat. *corporis truncus*; *kono-mi*, *arboris fructus*; *futa-no*, *tela paginæ*; *tsi-siro*, *pectoris liquor* (blood); *yama-bato*, mountain bird, wild pigeon. Derivatives from *stat*, under, below, inferior, are: *statru*, humility; *statno*, humble; *statni*, humbly; *stat-nisheru*, to humble; *stat-ninaru*, to be humbled; *stat-vonarsu*, to cause humiliation, &c. Other derivatives are: *yomo*, to read, *yomi*, reading, *yomite*, reader; *itamo*, to afflict, *itami*, affliction; *orano*, to hate, *orani*, hatred; *kako*, to write, *kakite*, writer, &c. The following are paraphrases for avoiding ambiguity: *fai-tori-gumo*, fly-catch-spider, for *kumo*, which means cloud as well as spider; *ine-kari-gama*, rye-cnt-scythe, for *kama*, scythe, frog, dish, &c. Many synonyms need explanation, as given in lexicons, where they are determined by sinograms, as for instance *ka-yari-bi*, fire-drive-gnats, because each of the three words has different meanings; *kami-fusuma*, a paper cloak, because *kami* sig-

nifies paper, god, head, above; *kino-doku*, mind-poison, grief; *ine-bikari*, rye-splendor, lightning; *issun-bōsi*, one-inch-bonze, for dwarf, &c. The following are examples of plurisignificants: *in-yen*, cause, banquet; *idzin*, to inhabit, to leave the house; *kanten*, heat and cold (so in Latin, *altus*, high and deep, *calidus* and *gelidus*, Eng. *cool* and *cool*, &c.). Many Yomi and Koye coincide, others diverge altogether in signification; thus; *kiba*, Jap. tool, Chin. cavalry; *kido*, Jap. city-gate, Chin. joy, anger, &c.—Among the principal authorities on the Japanese language are: Emanuel Alvarez, *De Institutione Grammatica Libri III, e Versione Japonica* (Amacusa, 1593); Joam Rodriguez, *Arte de la lingua de Japam* (Nagasaki, 1604); Didaco Collado, *Ars Grammaticæ Japonicæ* (Rome, 1632), and *Thesauri Linguae Japonicæ Compendium* (1638); Melchior Oyanguren, *Arte de la lengua Japona* (Mexico, 1738); C. P. Thunberg, *Observationes in Linguam Japonicam* (Upsal, 1792); Ph. F. de Siebold, *Epitome Linguae Japonicæ* (Batavia, 1826); J. Klaproth, *Mémoires sur l'introduction des caractères Chinois au Japon, et sur l'origine des syllabaires* (Paris, 1829); L. L. de Rosny, *Introduction à l'étude de la langue Japonaise* (Paris, 1836). Dictionaries: Medhurst, "Japanese-English and English-Japanese Vocabulary" (Batavia, 1830); Siebold, *Sin zoo zi lin gkok ben: Novus et Auctus Literarum Ideographicarum Thesaurus, &c., lapide exaratus a Sinensi Ko-ting-izhang* (1834), and *Isagoge* (*Va kan von seki*, 1841); Aug. Pütz-mayer, *Wörterbuch der Japanischen Sprache* (Vienna, 1851), from several Japanese and Dutch dictionaries, including one by Prince Naka-tsu (Yeddo, 1810); De Rosny, *Dictionnaire-Japonais-Français-Anglais* (Paris, 1857). There are many vocabularies in Latin by Jesuits, and others elaborated in common by Japanese and Dutch authors.

JAPANNING, the process of ornamenting wood, leather, paper, or metal by covering it with a brilliant hard varnish, in which are often introduced gilt or colored designs. The art is supposed to have been acquired from the Japanese, whence its name. It is still practised by them and the Chinese in great perfection, and specimens of it are seen upon the fancy work boxes, tables, and other small articles of furniture imported from eastern Asia. The articles thus ornamented are first made perfectly smooth, and primed with a mixture of ox gall and rotten stone. Being then again smoothed, they are next covered with a thin coat of varnish, obtained from the juice of certain trees, which, at first appearing like cream, changes by exposure to the air to a deep black. This being dried in the sun or by artificial heat and rubbed, another coat of varnish is applied, and another polishing succeeds; and thus these processes are repeated, it may be 18 times, using toward the last the finest quality of varnish, until a perfectly smooth and brilliant surface is obtained. The ornamental design is then drawn with a pencil dipped in varnish of boiled oil and tur-

pentine, and before this is quite dry the gold or silver leaf is laid upon it, and finally secured by another coat of varnish. The method in use of imitating this lacquered ware does not differ from the preparation of similar works in spirit or oil varnishes, except that every coat of color or varnish is dried by placing the object in a japanner's stove, which is heated by fires to as high a temperature as the articles and varnish can bear without injury. For colored grounds, the colors in ordinary use, as Prussian blue, vermilion, flake white, lampblack, and various others, are employed, well incorporated with linseed oil or turpentine, and mixed with copal or animé varnish, more commonly the latter. For black japanned work, the application is of ivory black mixed with dark-colored animé varnish. After thorough drying in the stove the application is repeated; and if intended to be finally polished, several coatings and dryings are required to give body of sufficient firmness to resist the rubbing action. After the general color of the ground has been laid on, the ornamental devices are painted in the usual manner, the colors being dried in and finally protected by several coats of varnish, made without drying ingredients, which also adds to their brilliancy. To produce a gold ground, the work is varnished with gold size, upon which, when partially dried, gold dust is laid with a piece of wash leather. Subsequent varnishing gives great brilliancy to this coating. Engravings, especially prepared for the purpose upon fine paper washed with solution of isinglass or gum, are sometimes transferred to japan work with beautiful effect.—It is apparent that wood designed for japanning must be thoroughly dried, so that there shall be no risk of its cracking, shrinking, or warping by the stove heat to which it is to be exposed. After undergoing the usual process of seasoning, it is therefore, when sawn into nearly the shapes required, baked for several days in the japanner's stove; and when after this the finished shapes are given to the articles, they are again baked, and any defects that appear are remedied by the application of white lead or putty, or otherwise. An artificial ground, prepared by a priming of size and whitening laid on with a brush, and after drying a day or two smoothed down with rushes and a wet cloth, is sometimes employed by japanners; but it is objectionable from its liability to crack. The practice of japanning has been greatly extended of late years to a multiplicity of articles, especially to those in papier maché, sheet iron, and leather. Beside the introduction of the ordinary colors and of gold leaf, mother-of-pearl is often profusely scattered through the work in the first two materials. A display of gaudy colors appears to be the chief object aimed at; and as works of taste most of the articles of this sort furnished for our markets are far inferior to some of the cheapest productions of the eastern nations.—The japanning of leather is most successfully conducted by the French. They furnish the best of the highly glazed brilliant ma-

terial known as patent leather, and large quantities are also produced in the United States, especially at Newark, N. J. The superior excellence of the French is owing to the better quality of the calf skins they employ, rather than to any difference in the process of japanning. They select the lightest and softest skins, such as American manufacturers, who sell their leather by the pound, do not find it an object to produce. The leather used at Newark is carried expressly for this purpose, and particular care is taken to keep it as free as possible from grease. The skins are then tacked on frames and coated first with a composition of linseed oil and umber, in the proportion of 18 gallons of the former to 5 oz. of the latter, boiled till nearly solid, and then mixed with raw oil and spirits of turpentine to the proper consistency; lampblack is also added when the composition is applied, in order to give color and body. From 3 to 4 coats of this are necessary to form a surface to receive the varnish; they are laid on with a sort of knife or scraper. To render the goods soft and pliant, each coat must be very light and thoroughly dried between each application. A thin coat is afterward applied of the same composition, of proper consistence to be put on with a brush, and with sufficient lamp-black boiled in it to make it a perfect black. When thoroughly dry it is cut down with a scraper having a turned edge, when it is ready to varnish. The principal varnish used is made from linseed oil and Prussian blue, boiled to the thickness of printers' ink. It is reduced with spirits of turpentine to a suitable consistence to work with a brush, and is then applied in 2 or 3 separate coats, which are scraped and pumiced until the leather is perfectly filled and smooth. The finishing coat is put on with especial care in a room kept closed and with the floor wet to prevent dust. The frames are then run into ovens heated to about 175°. In preparing this kind of leather the manufacturer must give the skins as high a heat as they can bear in order to dry the composition upon the surface as rapidly as possible without absorption, and cautiously so as not to injure the fibre of the leather.—Patent leather differs from enamelled leather mainly in the thoroughness of the process and quantity of material applied. The former is finished full and smooth, while enamelled leather is finished with as little composition as possible, and the grain is formed by rolling with the graining board. Instead of using lamp or ivory black as an ingredient in the varnish, various pigments may be introduced to give any desired colors to the leather, as, for blue, ultramarine or Prussian blue mixed with a little Krem's white, the red lakes for a red color, the ochres for their peculiar colors, and white lead for white. (See LACQUER, and PAPIER MACHÉ.)

JAPHETH, one of the 3 sons of Noah, by most critics regarded as the eldest. It is said of him (Gen. ix. 27): "God shall enlarge Japheth, and he shall dwell in the tents of Shem; and Canaan shall be his servant." He was the

progenitor of extensive tribes inhabiting the northern parts of the Mosaic world. His sons (Gen. x. 2) were Gomer, Magog, Madai, Javan, Tubal, Meshech, and Tiras. Gomer is now generally identified with the Cimmerians of the ancients; Magog probably represents Turanian Scythians about the Caucasus; Madai is the Hebrew name for Media; Javan for Ionia and Greece; Tiras probably for Thrace. Meshech and Tubal, who in the Scriptures always appear coupled together, are identified with the equally associated Moschi and Tibareni of the Greeks, and Muskai and Tuplai of the Assyrian inscriptions, the former of whom, according to Rawlinson (Herodotus, book i. essay xi.), "are regarded on very sufficient grounds as the ancestors of the Muscovites, who built Moscow, and who still give name to Russia throughout the East; and these Muscovites have been lately recognized as belonging to the Tchud or Finnish family, which the Slavonic Russians conquered, and which is a known Turanian race." This statement is made still more probable by the Hebrew text of Ezekiel xxxviii. 2, 3, and xxxix. 1, which connects Meshech and Tubal with Rosh, the latter word, rendered "chief" in the English version, being now regarded by the most competent critics, Gesenius and others, as a proper noun corresponding to the ὁ Ῥως of the Byzantine historians, and the people Rūs (on the Volga) of the Arabian Ibn Foslān, and thus containing the earliest historical trace of the Russian name. The rivers Moskva and Tobol may have received their names from Turanian dwellers on their banks, descendants of the men or tribes Meshech and Tubal. Thus Japheth, as a family name, embraces a large number of primitive nations, in modern ethnology generally designated as Turanian and Indo-European. This agrees with the traditions of the Arabians, which assigns Japheth 11 sons, progenitors of as many nations, among whom are Djin (the Chinese), Gomari (Cimmerians?), Turk (Turks), Khozar (Khazars), and Ros (Russians). The name Japheth has been variously derived from Hebrew roots designating "beautiful" and "expansion," and also compared with the Japetus of the Greek mythology, the son of Uranus and Gæa, and father of Atlas, Menætius, Prometheus, and Epimæthens. Japhetic is often used by ethnologists, instead of Indo-European.

JAPURA, YUPURA, or HYAPURA, a river of South America, a tributary of the Amazon. It rises in New Granada, among the Andes, in lat. 1° 20' N., long. 76° 50' W., receiving in its upper course the Mocoa, which pours into it the waters of a number of small streams, and the overflow of Lake Lecueva. It is known at first as the Caqueta. Its general direction is S. S. E. and S. E., until, having crossed the S. E. boundary of New Granada into the Brazilian province of Alto Amazonas, it bends suddenly toward the S. and joins the Amazon in lat. 3° S., long. 65° W. Its length is upward of 1,000 m., 350 m. of which is in Brazil. Its navigation is interrupted by cataracts.

JARDIN, KAREL DU. See **DUJARDIN, KAREL.**
JAROSLAV (Russian, *Yaroslavl*), a government of European Russia, bounded by Novgorod, Vologda, Kostroma, Vladimir, and Tver, and traversed by the Volga, between lat. 56° and 59° N., and long. 37° and 42° E.; pop. about 1,000,000. The surface is generally flat, and in various places marshy. There are several lakes, the largest of which is near the town of Rostov, in the S. E. part. The principal rivers beside the Volga are the Mologa, Sheksna, and Kotorosl. The soil, though almost everywhere arable, is not very fertile; the chief productions are grains, hemp, flax, fruits, and vegetables. The air is pure, but the winters are long and severe. The rivers yield fish abundantly, which form the principal article of export. The manufacture of woollens, linen, and other goods is carried on with some activity. The government is divided into 10 circles.—**JAROSLAV**, the capital, is situated at the junction of the Kotorosl with the Volga, about 160 m. N. E. from Moscow; pop. about 30,000. It is the seat of a Greek archbishop, and is tolerably well built, though mostly of wood, but is badly paved. It contains a great number of churches, the spires of which give the city a striking appearance at a distance. There are various schools, among others a lyceum richly endowed by Prince Demidoff, and possessed of valuable scientific collections. The principal manufactures consist of woollens, silk and cotton goods, leather, and tin ware; the trade in these and in grains is active. The city is one of the most ancient in Russia, and was once one of the most important, being the capital of the great principality of its name. It was partly destroyed by a conflagration in 1737.—Another old town of the same name, properly Jaroslaw, is situated on the San, in Austrian Galicia, circle of Przemysl; pop. about 7,000.

JARVES, JAMES JACKSON, an American author, born in Boston, Mass., Aug. 20, 1818. He received his early education in Boston, but on account of weakness of his eyes abandoned his college studies. In 1838, in consequence of ill health, he sailed for the Sandwich islands, and resided for several years in Honolulu, where he published the first newspaper ever printed there, called the "Polynesian." During his residence in the Sandwich islands, he travelled extensively in California, Mexico, and Central America. After his return to the United States he published a "History of the Hawaiian or Sandwich Islands" (8vo., Boston, 1843); "Scenes and Scenery of the Sandwich Islands" (12mo., 1844); and "Scenes and Scenery in California" (1844). For several years past he has resided in Europe, chiefly in Florence, devoted to the study of art, and engaged in making a collection of pictures to form the nucleus of an American gallery. During this period he has published "Parisian Sights and French Principles," &c. (12mo., New York, 1855); "Art Hints" (8vo., London, and 12mo., New York, 1855); "Italian Sights and Papal Principles," &c. (1856); a

second series of "Parisian Sights" (1856); "Kiana, a Tradition of Hawaii" (1857); and "Confessions of an Inquirer, in three Parts. Part I.: Heart Experience" Boston, (1857).

JARVIS, ABRAHAM, D.D., bishop of the Protestant Episcopal church in the diocese of Connecticut, born in Norwalk, May 5, 1739, died May 3, 1813. He was graduated at Yale college in 1761, and commenced the preparatory studies for orders, officiating meanwhile as lay reader. In the autumn of 1763 he sailed for England, arriving in London in Jan. 1764. Here he was ordained deacon in February, and priest a few weeks later. He left England in April, and returning home was settled as rector of Christ's church, Middletown, Conn. On the death of Bishop Seabury, he was unanimously elected his successor, and in Oct. 1797, was consecrated at New Haven by Bishops White, Provoost, and Bass. In 1796 the degree of D.D. was conferred upon him by Yale college.—**SAMUEL FARMAR, D.D., LL.D.**, an American clergyman, son of the preceding, born in Middletown, Conn., Jan. 20, 1786, died March 26, 1851. He was graduated at Yale college in 1805, was admitted to deacon's orders in the Protestant Episcopal church in March, 1810, and in April, 1811, was ordained to the priesthood. He then took charge of St. Michael's church, Bloomingdale, N. Y., and in 1813 became rector of St. James's church, which was near by, holding the associate rectorship of those parishes until May, 1819. In this year he held the post of professor of biblical criticism in the general theological seminary of the Episcopal church. The university of Pennsylvania conferred upon him the degree of D.D. in 1819. The next year he was chosen rector of St. Paul's church, Boston, where he remained for the following 6 years. In 1826 he resigned his parish, and went to Europe for the purpose of pursuing a special course of study connected with ecclesiastical history. He spent the following 9 years in visiting the principal great European libraries, and in researches in his favorite branch of learning, 6 years being passed in Italy. Returning to the United States in 1835, he filled for two years the professorship of oriental literature in Washington (now Trinity) college, Hartford. The degree of LL.D. was conferred upon him in 1837 by this institution, and the same year he was elected rector of Christ's church, Middletown. In 1838 he was appointed by the general convention historiographer of the church. At Easter, 1842, he resigned his rectorship, and thenceforward devoted himself to his historical studies. Beside contributions to the "Church Review," sermons, and occasional addresses, Dr. Jarvis was the author of a "Discourse on the Religion of the Indian Tribes of North America" (8vo., New York, 1820); "Chronological Introduction to the History of the Church" (8vo., New York and London, 1844); "Reply to Dr. Milner's End of Controversy" (12mo., New York, 1847); and the "Church of the Redeemed, or the His-

tory of the Mediatorial Kingdom" (Svo., vol. i., Boston, 1850). This last work was interrupted by the author's death.

JASHER, Book of, a work cited in Joshua x. 13 and 2 Sam. i. 18, but no longer extant. Theodoret supposed the whole book of Joshua to be an extract from it; Jerome and some other authors, that it was identical with the book of Genesis; Bishop Lowth, from the poetical character of the citations from it, that it was a collection of national songs; others, that it included the whole Pentateuch, that it was a treatise on archery, and that it contained a series of biographies of just men. De Wette derives an argument in favor of the late composition of the book of Joshua, from its citing the book of Jasher, which points to the time of David. Dr. Donaldson regards the Old Testament as a careless elaboration of materials taken from the dismembered book of Jasher, which he attempts to restore to their original order. One reason of the interest connected with the book is that it is referred to (Josh. x. 13) as the authority for the standing still of the sun and moon. (See Donaldson, *Jasher, Fragmenta Archetypa Carminum Hebraicorum in Masorethico Veteris Testamenti Textu passim Tessellata*, 1854.)—A treatise on Jewish laws written by Rabbi Thaim in the 13th century, and printed at Cracow in 1617, bears the title of "Book of Jasher." Another mediæval work in Hebrew (Naples, 1625) bears the same title, and claims to have been discovered at the destruction of Jerusalem in possession of a concealed old man, and to have been brought thence to Spain, and preserved at Seville. In 1751 a Bristol type-founder, named Jacob Ilive, published a forgery entitled the "Book of Jasher, with Testimonies and Notes Explanatory of the Text; to which is prefixed Various Readings; translated into English by Aleuin of Britain, who went a pilgrimage into the Holy Land." This clumsy fraud was revived at Bristol, 1827; at London, 1833, edited by C. R. Bond; and at New York, 1840, edited by M. M. Noah.

JASMIN, JACQUES, a French provincial poet, often called the barber poet and the last of the troubadours, born in Agen, March 6, 1798. He was the child of a hunchbacked tailor and a lame mother, from whom he inherited little beside poverty, and the prediction, founded on the experience of many generations, that the Jasmins must inevitably die in the alms house. His childhood, the events of which are described in his piece entitled *Mous soubenis* ("My Souvenirs"), was one of privation and hunger; but these he might have endured with cheerfulness, of which he possessed an unfailing supply, had he not been tormented with an eager thirst for education, which the limited means of his parents did not admit of his receiving. At about the age of 12, however, he gained admittance into a priests' seminary, where for 2½ years he made rapid progress in his studies. At the end of that period an act of youthful indiscretion caused his dismissal in disgrace, and a few

months later he was apprenticed to a barber and hair dresser in Agen. At about 18 years of age he was married and set up in business for himself. His leisure hours now, as during his apprenticeship, were devoted to the acquisition of knowledge; and from reading plays and romances he took to verse writing, which so alarmed his young wife that she persistently removed his pens and paper, and placed other obstacles in his path to authorship, in the belief that a close attention to his business was the best means of preserving the family from its hereditary misfortune. Jasmin obeyed the hint so far as to stick to his calling, which he has steadily practised down to the present time. No discouragement, however, could induce him to give up his passion for reading and writing verses; and gradually his rural songs, written in the *langue d'Oc*, the tongue of the southern troubadours, and still the language of the peasantry of southern France, found warm admirers among his friends and neighbors. In 1825 he ventured upon the publication of a burlesque poem, *Lou chalibari* ("The Charivari"), in which he showed himself a master of easy and natural versification, and of the idiom of his language. During the next 10 years he produced a variety of pieces, many of which were suggested by political events, and local tradition or romance, including his "Ode to Charity" (1830), "The Third of May" (1830), *Soubenis* (1832), and "Stanzas to the Scattered Remains of the Polish Nation" (1833). These were collected in 1835 and published in 2 vols. under the title of *Las papillotes de Jasmin* ("The Curl Papers of Jasmin"), in appropriate reference to the calling of the poet. His next piece, *L'abuglo de Castel-Cuillé* ("The Blind Girl of Castel Cuillé"), founded on a pathetic peasant legend of Guienne, is perhaps the most popular of all he has written, and has been frequently recited by the author in public or private assemblies. During a visit to Paris, the only one he ever made, he repeated the recitation of it 26 times in 15 days, on the last occasion in presence of Louis Philippe and the royal family at Neuilly. The poem is familiar to English readers through the translation by Longfellow. *Françonette*, produced in 1840, is his longest and most ambitious piece. Among his remaining works are a second series of the *Papillotes* (1843), *Lous dus frays bessous* ("The Two Twin Brothers," 1847), *Maltro Pinnoucento* ("Mad Martha"), and many minor pieces. The language in which these works are written, though called a *patois*, is really an ancient and independent idiom, differing in but few respects from the language once common to the whole south of France, and at the present day is the vernacular tongue of a considerable portion of the French population. The fact, however, that it is not the French of the metropolis, and that all Jasmin's works have to be translated into ordinary French to be intelligible to two thirds of the people, has detracted from the popularity which he would otherwise have enjoyed. In

the south of France, and particularly in Guienne and Gascony, not the slightest doubt is entertained that the "barber poet," as he is affectionately called, is one of the most illustrious names in literary history; and Jasmin himself, with a frankness quite unaffected, told Mr. Reach, who records the conversation in his book entitled "Claret and Olives, from the Garonne to the Rhone," that "God only made four Frenchmen poets, and their names are Corneille, La Fontaine, Béranger, and Jasmin." Jasmin is received upon his annual tours through the southern provinces with fêtes, banquets, and a variety of ovations, and his public recitations of his poems are attended by enthusiastic multitudes. He devotes to public charitable uses the large sums he frequently receives on these occasions, relying chiefly on his business for a support. It was doubtless in grateful remembrance of this trait that his professional brethren in Paris honored him during his visit to that city with a grand banquet. In personal appearance he is well built, with a massive head, piercing black eyes, and swarthy features, which would be heavy but for the ever varying expressions which continually play over them. In his shop in Agen, on the front of which is a large sign, inscribed *Jasmin, perruquier coiffeur de jeunes gens*, he is generally to be found busily practising his trade. Testimonials of every description, awarded by cities, and persons distinguished in literature or public life, are scattered about in profusion, and the poet wears at his button hole the red ribbon of the cross of the legion of honor, and signs himself *Jasmin, coiffeur, de las académies d'Agen et de Bordéou*.

JASMINE, a flowering plant of several species, belonging to the natural order *jasminaceæ*. The common jasmine (*jasminum officinale*, Linn.) is an elegant, deciduous, climbing shrub, with white flowers of exquisite odor. It has long been cultivated in the garden, but the time of its introduction as well as its native country is unknown. In 1597 Gerard mentions it as in common use in England for covering arbors. The name of jasmine is derived from another species, the *J. Sambac*, which is the *yasmyn* of the Arabs. This species is an evergreen shrub, and is held in high esteem both in the East and West Indies. At one time the only specimen known in Europe grew in the garden of the grand duke of Tuscany at Pisa, where, according to Evelyn, the plant was put under guard so that no cuttings might be purloined. A specimen was sent to Miller in 1730, by which means the species was restored to cultivation in England, having been previously lost from the Hampton Court garden, where it grew at the end of the 17th century. It is now a common greenhouse shrub; and a variety of it is known with double flowers. The Italian jasmine (*J. humile*) has yellow blossoms, which are also very odoriferous; in Madeira, where it grows wild, it is an erect shrub from 3 to 4 feet high, and flowers from June to September. It derives its trivial name from being annually imported with dwarf

orange trees from Genoa into England. The revolute-flowered jasmine (*J. revolutum*, Ker) is a native of Hindostan and of Nepaul, having shining leaves and bright yellow flowers. It was introduced into England in 1812, and was at first treated there as a greenhouse plant, but has since been considered in that country as a wall shrub, where it attains the height of 15 feet. It is said to grow finely and blossom freely in any kind of soil. The sweetest scented sort is the *J. odoratissimum*, from Madeira, having yellow flowers. The Azorean jasmine (*J. Azoricum*) has climbing stems, which also twine; the leaves are trifoliate, and the flowers are white. A species from the Cape of Good Hope is known as the glaucous jasmine (*J. glaucum*), with lanceolate leaves like those of the common privet, and with white flowers larger than those of the common jasmine, which they otherwise resemble. These last 3 are considered to be only half hardy even in England. The blossoms of the chumbelee (*J. grandiflorum*) are strung upon threads and worn among the hair by the native women of those parts of the East Indies where it is found indigenous. The jasmines are all twining or rambling shrubs, with simple or else compound, mostly evergreen leaves, and with white or yellow highly scented flowers. They are readily propagated from cuttings, and may be trained to walls or grown in pots, the latter method being proper in our northern states. The jasmines are chiefly inhabitants of tropical India, abounding in all parts of the country. Only a single species is mentioned as belonging to South America, but an allied genus, *Bolivaria*, represents them in at least 3 species on that continent. A fine East Indian shrub belonging to the same natural order is the *nyctanthes arbor tristis*, whose short-lived blossoms of a few hours' duration scent the garden at night only, with an exquisite perfume.—The genuine oil of jasmine of the shops is obtained from the common jasmine and the great-flowered jasmine, but a similar perfume is derived from the Sambac. In India the root of *J. angustifolium*, which is extremely bitter, is used as an external application to cases of ringworm. Some other species with bitter leaves have been considered as stomachics or as affording agreeable cephalic medicines.

JASON. See ARGONAUTS.

JASPER, a variety of the quartz family occurring in the form of rocky masses, which often make up the greater portion of hills of considerable size. It is of various shades of red, yellow, brown, and green, the colors sometimes arranged in stripes, when it is called ribbon jasper. The hues are derived mostly from iron in different degrees of oxidation, and the stripes are sometimes found to be the marks of former stratification of the rock, which are retained in the metamorphic product, and sometimes presented in a brecciated appearance resulting from the forcible breaking up of the strata. From the extreme hardness of the stone and its susceptibility of taking a high polish, it is much

used for ornamental purposes, having similar applications to porphyry. Bloodstone or heliotrope is a deep green variety of jasper with blood-red spots. Lydian stone or touchstone is a velvet-black, flinty variety, used for testing the purity of alloys of gold. The alloy is rubbed upon the stone so as to leave upon it a metallic streak, and the quality is estimated by the color produced on applying nitric acid. (See GOLD.) The fitness of the stone for this use arises from its easily abrading the metal, not being itself affected by the acid, and presenting a dark smooth ground best adapted for exhibiting shades of color. Mr. Atkinson, in his work on "Oriental and Western Siberia" (1858), speaks of the jasper in the upper valleys of the Ural, and found himself some beautiful specimens of it in a ravine on the banks of the river Irtysh, some of the rocks there being jasper of a dark reddish brown and others of a deep purple. He observed blocks of a beautiful dark green jasper on the banks of the Mein, in the neighborhood of the Tcherney (Black) Beryl, and in several other localities; also jasper of a deep red color in the valley of the Eremil. The principal deposit of jasper is the gorge of the Korgon. The labor of cutting out the large blocks is enormous; the workmen drill holes 5 inches apart the whole length of the block, and to the depth required; into these they drive dry birch-wood pins, which they keep wet till they swell and burst off the mass. The workmen arrive at the Korgon in May, and remain there until September, when they return to their homes, some of which are at a distance of 400 to 500 m. Small stone huts are built against the precipices at the bottom of the ravine, where they live, stowed away in filth and wretchedness, feeding upon black bread and salt, and receiving their poor pittance of 62½ cts. a month. Several cases of this jasper were exhibited in the London crystal palace in 1851, and a medal was awarded to them.

JASPER, the name of 7 counties in the United States. I. A central co. of Ga., bounded W. by the Ocmulgee river; area, 480 sq. m.; pop. in 1852, 9,968, of whom 6,084 were slaves. The surface is uneven and the soil moderately fertile. The productions in 1850 were 460,680 bushels of Indian corn, 62,898 of oats, 78,734 of sweet potatoes, 9,899 bales of cotton, and 3,420 lbs. of rice. There were 5 grist mills, 2 saw mills, 27 churches, and 213 pupils attending public schools. Gold, iron, granite, jasper, and garnets are found in the county. Value of land in 1856, \$1,568,605. Organized in 1807, and named in honor of Sergeant Jasper. Capital, Monticello. II. A S. E. co. of Miss., drained by Tallahoma river; area, 650 sq. m.; pop. in 1850, 6,184, of whom 1,887 were slaves. The surface is uneven and the soil fertile. The productions in 1858 were 209,691 bushels of Indian corn, 78,945 of sweet potatoes, 39,110 lbs. of rice, and 1,442 bales of cotton. There were 8 grist mills, 1 saw mill, 1 newspaper office, 14 churches, and 339 pupils attending public schools. Capital, Paulding.

III. A S. E. co. of Texas, bounded W. by the Neches river, which is here navigable by steamboats, and drained by Angelina river; area, 918 sq. m.; pop. in 1858, 3,269, of whom 1,198 were slaves. The surface is undulating and hilly and well timbered. The soil is thin, but in the neighborhood of the streams very fertile; a large part of it is devoted to pasturage. The productions in 1850 were 44,498 bushels of Indian corn, 15,745 of sweet potatoes, and 359 bales of cotton. There were 6 saw mills, 1 newspaper office, 1 church, and 140 pupils attending public schools. Value of land in 1858, \$273,920. Capital, Jasper. IV. A N. W. co. of Ind., bordering on Ill., bounded N. by Kankakee river; area, 984 sq. m.; pop. in 1850, 3,540. The surface is mostly a level prairie, diversified with tracts of timber, and composed partly of the Kankakee marshes or wet prairies. The soil is suitable for pasturage. The productions in 1850 were 250,895 bushels of Indian corn, 9,051 of wheat, 27,376 of oats, 3,822 tons of hay, and 10,811 lbs. of wool. There were 3 grist mills, 3 saw mills, 1 church, and 238 pupils attending public schools. Capital, Rensselaer. V. A S. E. co. of Ill., intersected by Embarras river; area, 484 sq. m.; pop. in 1855, 6,842. It has a level and in some places marshy surface, about $\frac{2}{3}$ of which is occupied by prairies. Much of the soil is fertile. The productions in 1850 were 132,585 bushels of Indian corn, 3,540 of wheat, 19,620 of oats, and 4,369 lbs. of wool. There were 2 grist mills, 2 saw mills, 7 churches, and 180 pupils attending public schools. Capital, Newton. VI. A S. W. co. of Mo., bordering on Kansas, and drained by Spring river; area, 980 sq. m.; pop. in 1856, 5,223, of whom 289 were slaves. It has an undulating surface and a good soil. The productions in 1850 were 275,116 bushels of Indian corn, 16,909 of wheat, 63,265 of oats, 201 tons of hay, and 11,775 lbs. of wool. There were 5 grist mills, 5 saw mills, 8 churches, and 369 pupils attending public schools. Capital, Carthage. VII. A central co. of Iowa, traversed by Skunk river and the N. fork of that stream; area, 720 sq. m.; pop. in 1859, 9,195. It has an undulating surface, occupied in great part by fertile prairies, and thinly timbered. Coal is abundant. The productions in 1859 were 609,156 bushels of Indian corn, 16,991 of wheat, 10,199 of oats, 30,694 of potatoes, 18,672 lbs. of wool, 132,058 of butter, 8,545 tons of hay, and 18,713 galls. of molasses. Capital, Newton.

JASPER, WILLIAM, an American revolutionary soldier, born in South Carolina about 1750, killed at the assault on Savannah, Oct. 9, 1779. At the commencement of the revolutionary war he enlisted in the 2d S. C. regiment, in which he became a sergeant. Subsequently, in the attack upon Fort Moultrie by a British fleet, he distinguished himself by leaping through an embrasure to the ground, under a shower of cannon balls, and recovering the flag of South Carolina, which had been shot off. On this occasion Gov. Rutledge presented him with his own

sword, and offered him a lieutenant's commission; this, however, Jasper, who could scarcely read or write, refused, saying: "I am not fit to keep officers' company; I am but a sergeant." His commander, Col. Moultrie, appreciating his bravery and coolness, gave him a roving commission to scour the country with a few men, and surprise and capture the enemy's outposts. His achievements in this capacity seem to belong to romance rather than history, and in boldness equal any recorded in the revolutionary annals of the southern states. Prominent among them was the rescue by himself and a single comrade of some American captives from a party of British soldiers, whom he overpowered and made prisoners. At the assault upon Savannah he was in the column which under D'Estaing and Lincoln attacked the Spring Hill redoubt, and received his death wound while fastening to the parapet the standard which had been presented to his regiment by Mrs. Elliott. His hold, however, never relaxed, and he bore the colors to a place of safety before he died. His last words were: "Tell Mrs. Elliott I lost my life supporting the colors she presented to our regiment." A county of Georgia and a square in Savannah have been named after him.

JASSY, the capital of Moldavia, in European Turkey, on the Baglaj, a tributary of the Pruth, lat. 47° 8' N., long. 27° 30' E.; pop. about 60,000. It is built partly on a hill and partly in a valley; and as many of the houses are surrounded by gardens, it covers a comparatively large space. It has few spacious streets, but a great number of churches and convents, among which the metropolitan church of St. Nicholas and the church of Three Saints are particularly remarkable. There are also several palaces belonging to distinguished boyar families, and in the vicinity of the city the princely summer residence Copola attracts the attention of travellers. There are various schools, a large bazaar, and public baths. The trade of the city is in great part in the hands of the Jews, who form a considerable part of the population. The manufactures are unimportant. Jassy is the *Jassiorum Municipium* of the Romans, so called from the Jassii, a people of Dacia. Trajan built here a residence, which was destroyed by fire in the last century. Conflagrations frequently visit the city; one of the most disastrous happened in 1822. A peace was concluded here in 1792 between the Russians and Turks. In the wars of these nations, including the last, Jassy was often the headquarters of the contending armies.

JAUBERT, PIERRE AMÉDÉE ÉMILIEN PROBE, chevalier, a French orientalist, born in Aix, June, 3, 1779, died in Paris, Jan. 28, 1847. A graduate of the school for the oriental languages, he was in 1798 appointed assistant interpreter in the French expedition to Egypt, was of great service to Bonaparte in his intercourse with the people of Syria, and accompanied him on his return to France. After the 18th Brumaire he was appointed secretary interpreter of the government, and professor of

the Turkish language in the oriental school in Paris. In 1802 he accompanied Col. Sebastiani in his mission to Egypt, Syria, and the Ionian islands. Attached in 1804 to the embassy of Gen. Brune at Constantinople, he aided in obtaining the acknowledgment by the Porte of Napoleon as emperor of the French. In 1805 he started on a mission to Persia, was stopped on his way by the pasha of Bayazid, who wanted to appropriate the splendid presents sent to the shah, and was for nearly 4 months incarcerated in a cistern. Released from his prison by the death of his persecutor, he reached the residence of Futteh Ali Shah, who received him with distinction. On his return, Napoleon granted him a pension and several offices and honorary rewards, and finally appointed him chargé d'affaires to Constantinople. In 1818 he travelled again through the East, and brought to France a herd of those Thibetan goats whose hair is used in the manufacture of shawls. For the rest of his life he was exclusively engaged in his duties as a professor and translator of the oriental languages. He was made a member of the academy of inscriptions in 1830, and under Louis Philippe was promoted to a peerage, to the professorship of the Persian language at the college of France, and the directorship of the oriental school. The most important of his publications are: *Voyage en Arménie et en Perse* (Svo., Paris, 1821); *Éléments de la grammaire Turque* (4to., 1823); and a French translation of Edrisi's Arabian geography (2 vols. 4to., 1837-'41).

JAUNDICE (Fr. *jaunisse*, from *jaune*, yellow), a disease known by the yellowness of the eyes, skin, and urine, the color of the skin sometimes becoming yellowish green or brown, the stools being usually whitish, and the course of the bile obstructed. Epidemics of jaundice have been observed, especially during and after military campaigns, during sieges, &c.; and the disease is sometimes endemic, as in damp localities exposed to high temperatures. The attack is usually preceded by symptoms of disorder of the liver and digestive organs, such as loss of appetite, irregular bowels, or constipation, colic pains, nausea, headache, languor; uneasiness in the region of the stomach and liver; thirst, unpleasant taste in the mouth, tongue loaded at the base; feeling of sinking, &c. Sooner or later the yellowness of surface appears; sometimes this is the first symptom, and it usually takes in order the eye, the face, neck, chest, and then the whole body. At first a light yellow, it deepens to a golden or orange hue, sometimes greenish. The color may appear in parts of the surface only, in a palsied side, the face, or a single eye; or while yellow in some parts, it may be green or almost black in others, constituting what is known as the black jaundice. The yellow tinge of visible objects, showing that the coloring matter has diffused itself through the humors of the eye, undoubtedly occurs, but is somewhat rare. The perspiration is yellowish. Fever, with quick

or hard and full pulse, appears in cases of active congestion or inflammation of the liver; in others, the pulse may be natural or irregular. From the time of the appearance of the yellow hue, however, many of the preliminary symptoms may diminish. The attack is often sudden; when following violent emotion, almost instantaneous. The course and duration are various, the disease disappearing or proving fatal as early as the 4th day, or lasting for months or years. The darker forms are most rapid and oftenest fatal. Favorable crises occur in the form of bilious diarrhoea, profuse perspiration, hæmorrhage, or menorrhagia; or improvement begins more quietly, the color fading from the surface in the reverse of the order of its appearance. Severe complications and sequels are liable to appear; among these are diarrhoea, cutaneous eruptions, inflammation or abscess of the liver, disease of the spleen or pancreas, general dropsy, dysentery, coma, epilepsy, apoplexy, and inflammation of the brain. A fatal termination is very liable to be preceded by these complications, or it is ushered in by despondency and sinking, by ascites or hydrothorax, by loss of assimilative power, emaciation, and hectic; death with coma or other cerebral symptoms, due to retention of bile in the circulation, and its action as a poison upon the nervous system, is frequent; and this result is more likely to occur to those whose nervous energies are broken by overwork or excesses. Authors distinguish, as forms of the disease, the idiopathic and symptomatic; continued and recurrent; febrile and non-febrile; inflammatory, plethoric, and nervous; sporadic, endemic, and epidemic; mild and malignant.—The obvious indications as to treatment are to promote secretion of the bile, and to favor its removal. In ordinary cases a strong infusion of the bitter-root taken freely, so as to keep up a laxative action, but not so as to purge actively or to vomit, with a daily application of the dripping-sheet for about one minute, free ventilation, a very spare, simple diet until the symptoms mend, and hot fomentations twice a day for half an hour over the liver in cases of torpor or obstruction, or cold cloths in case of excessive production of bile, will usually effect a sure and often a speedy return to health. Generally, in the active stages, much prudence is required to guard, on the one hand, against increasing vascular excitement, and on the other, against augmenting the vital depression.

JAVA, a Dutch colony, the third island in size, and the first in political and commercial importance, of the Malay archipelago, between lat. $5^{\circ} 52'$ and $8^{\circ} 40'$ S., and long. $105^{\circ} 12'$ and $114^{\circ} 4'$ E. It is bounded N. by the sea of Java, which separates it from Borneo; E. by a strait 2 m. wide, which separates it from the island of Bali; S. by the Indian ocean; and W. by the strait of Sunda, which separates it from Sumatra. Its length from E. to W. is 666 m., and its breadth varies from 36 to 126 m.; area, 50,000 sq. m. The coast line of the island is about 1,400 m. in extent, and is remarkably destitute of harbors, especial-

ly on the S. side, where there are but two ports, Pachitan and Chalachap. On the N. coast the best harbor is that of Surabaya, but there are many open roadsteads with good anchorage, and the want of landlocked harbors is little felt in the calm waters of the Java sea, where hurricanes are unknown, and storms occur only at the change of the monsoons. On the S. side there is no safe anchorage, the coast being bold and the ocean very deep, while a heavy and dangerous surf rolls continually on the shore.—The geological formation of Java is highly volcanic. A range of mountains runs from one end of the island to the other through the centre, with peaks varying in height from 4,000 to 12,000 feet. Among these peaks are 46 volcanoes, 20 of which are in a state of activity. The most remarkable of these is the Tenger mountain in the E. part of the island. It rises from a very large base in a gentle slope with gradually extending ridges. The summit, seen from a distance, appears less conical than that of the other volcanoes, and is about 8,000 feet high. The crater is more than 1,000 feet below the highest point of the mountain. It is the largest crater on the globe, with perhaps the single exception of that of Kilæua in the Sandwich islands. Its diameter is 3 miles, and it forms an immense gulf with a level bottom covered with sand. From its centre rise 3 cones several hundred feet in height, one of which, called Brahma, is in almost constant activity. South of the great central range is another range of mountains about 3,000 feet in height, which skirts the S. coast. It is composed of volcanic materials, chiefly basalt, and is called by the Javanese *Kandang*, or “war drums,” from the peculiar columnar form of its rocks. The S. shore of the island is frequently bounded by steep piles of trap. Low ranges of limestone are seen in the eastern part, and in the extreme west a few granite boulders are occasionally found. Hot springs are numerous at the bases of the volcanoes, and some of them are thoroughly impregnated with carbonic acid. In the lowlands there are mud volcanoes, which furnish muriate of soda. There are 7 great plains in Java: those of Bandawasa and Pugar in the E. section; those of Surakarta, Madiyun, Kadirî, and Malang in the middle section; and in the W. that of Bandong. These plains are fertile and well watered by streams from the mountains, which afford an abundant supply for irrigation. There is also a long alluvial tract running along the N. side of the island, which may be regarded as a continuous plain, and many of the mountain valleys are also spacious and fertile.—There are a few small and beautiful lakes among the mountains, and some extensive marshes, which in the rainy season become lakes, and are navigated. The largest of these is in the province of Banunias, and is close to the S. shore. The rivers on the N. side of the island are very numerous, but are all short, and none of them navigable for large vessels, being all more or less obstructed by bars of mud

or sand at their mouths. They are, however, of great use for irrigation, and contribute largely to the immense agricultural capacity of the island. The largest river in Java is the Solo, which rises in one of the low ranges on the S. side of the island, and after a winding course of 400 m. empties by two mouths into the narrow strait which separates Java from the W. end of the island of Madura. This river is navigable all the year by small boats, and by large ones in all the months except August, September, and October, the last 3 months of the dry season. The second river in size is called by the natives the Brantas, but usually by Europeans the river of Surabaya. It rises like the Solo in the low southern range of mountains, receives many affluents, and empties also by two mouths into the Madura strait, after passing by the city of Surabaya and contributing to form its harbor.—The seasons in Java are divided into the wet season or summer, which begins with October and ends with March, and the dry season or winter, which includes the rest of the year. The monsoons or periodical winds from the N. W. and S. E. are those of the southern hemisphere. Their setting in is irregular, and even during their prevalence there is sometimes dry weather in the wet season and wet weather in the dry. At the equinoxes the weather is generally tempestuous, and thunderstorms at that period are frequent and sometimes destructive. The temperature of the island is equable, the thermometer in the lowlands seldom rising above 90° or falling below 70°. Snow never falls even on the highest mountain peaks, but in midwinter ice a few lines thick is sometimes seen at great elevations, and the thermometer falls to 27°. At the height of 4,000 feet in the mountain valleys there is a delightful climate, healthful to the European constitution, and favorable to the growth of northern fruits and vegetables. The general climate of the island is in point of salubrity equal to that of any tropical country; and in places where malaria has formerly prevailed, as in Batavia and Cheribon, the evil has been clearly traced to the neglect of water courses, and has been ameliorated by proper attention to drainage.—The metals found in Java are considerable in quantity and value, and no veins are worked. The botany of the island is very rich. It is covered at all seasons with luxuriant verdure, which spreads over the whole land, with the exception of a few mountain peaks of lava and some small patches of sandy shore. The chief variety in the vegetation is caused by the difference of the elevation. On the low coast are found superb palms, bananas, aroids, *amaranthaceæ*, poisonous *euphorbiaceæ*, and papilionaceous legumes. At the height of 1,000 feet ferns preponderate, and magnificent forests of slender bamboos grow spontaneously. At a greater height are forests of fig trees, with tall trunks, spreading branches, and thick foliage, and the ferns here increase in number and size, and often grow to the height of several feet.

Still higher the fig trees are mingled with gigantic rasimalas or liquidamber trees with white trunks. Above the region of figs and rasimalas is that of oaks and laurels, with abundant melastomas and orchideous plants. At the height of 6,000 feet the tropical character of the vegetation disappears and is succeeded by *rubiaceæ*, heaths, coniferous and other plants familiar to countries beyond the tropics. Cryptogamous plants are extensively multiplied; mushrooms are abundant, and mosses cover the ground and invest the trunks and branches of trees. The ferns are smaller in size than those below, and constitute the mass of the vegetation.—The animal life of Java is as varied and abundant as its vegetation. Of mammiferous animals alone it is said to have 100 species, several of them peculiar to the island. There are 4 species of monkey, a species of sloth not found elsewhere, and numerous species of bats, one of which called *kalung* is remarkable for its size and numbers. Wild feline animals are very numerous. The tiger, similar to that of Bengal, infests all the forests, and there are one large and two small kinds of leopard, and also two species of wild dogs, and two of wild hogs. There is a species of rhinoceros peculiar to Java, which is easily tamed and rendered very gentle. The buffalo and the ox exist in a wild state in the forests, and there are 6 different species of deer. Among the domestic animals are the ox, the buffalo, the horse, the goat, and a few sheep. Of birds 176 species have been enumerated, among them the peacock, partridge, quail, 10 different species of pigeon, 11 species of heron, and 2 of cuckoo. The mina bird, so apt in learning to mimic human speech, is common, and the Java sparrow is too plentiful for the safety of the rice crop which affords its favorite food. Birds of prey are numerous, including 8 species of eagles and 7 of owls. Fish are plentiful along the coast, but those of the rivers are of inferior quality as food. Excellent oysters are abundant on the N. coast, and prawns, from which a condiment called *trasi* is prepared and largely consumed by the natives.—Though in reality Java is wholly possessed by the Dutch, two native kingdoms, comprising together not more than $\frac{1}{4}$ of the island, have been suffered to retain a nominal existence, under the control of the Dutch officials. These are the dominions of the *senan* or emperor of Surakarta, and the sultan of Jokjokarta. The rest of the island is divided into 20 provinces, called residencies, each of them being governed by a Dutch official called a resident. Six of these belong to the country of the Sundese, and 14 to that of the Javanese. The principal cities are Batavia, the capital of the island, Bantam, Cheribon, Samarang, Surabaya, Surakarta, and Jokjokarta.—The native population of Java comprises two distinct nations, the Sundese and the Javanese. The Sundese occupy the W. end of the island, and are greatly inferior in number to the Javanese, and less advanced in civilization. They speak a distinct language. Both nations

are of the Malayan race. They are generally about two inches shorter than the men of the Mongolian and Caucasian races, with round faces, wide mouths, high cheek bones, short and small noses, and small, black, deep-seated eyes. The complexion is brown with a shade of yellow, and is never black. The hair of the head is thick, black, lank, and harsh, and is either scanty or altogether wanting on other parts of the body. A few short, straggling hairs compose the beard. The people are not active, and make but poor runners or wrestlers. They are described as a peaceable, docile, sober, simple, and industrious people. Mr. Crawford, author of "A Descriptive Dictionary of the Indian Islands," who lived several years in Java, says: "From my own experience of them, I have no difficulty in pronouncing them the most straightforward and truthful Asiatic people that I have met with. The practice of running a muck, so frequent with the other cultivated nations of the archipelago, is of very rare occurrence with them." Java is one of the most densely peopled countries of the world, the population by the census of 1856 amounting to 11,116,680, of whom 7,850,250 were Javanese, 2,950,145 Sundese, 195,260 Chinese, 76,125 Malays, 15,250 Arabs, and 11,500 Buginese from Celebes. The Europeans, who are mostly Dutch, the ruling class in the island, numbered 18,150, including soldiers and half-breeds. The number of inhabitants to the square mile on the whole island is 222, but in some of the provinces the average is about 600.—The Javanese are almost entirely occupied in agriculture. There is a small class of fishermen on the N. coast, and a few artisans in the towns, but the great bulk of the people live directly or indirectly by the cultivation of the land, in which they have made greater progress than any other Asiatic nation except the Chinese and Japanese. The chief crop is rice, of which with the aid of irrigation, industriously and almost universally applied, two crops are raised in a year. Lands that cannot be irrigated are used for growing pulses, oil-giving plants, cotton, sugar cane, and tobacco; and on the mountain slopes, at an elevation of 2,000 or 3,000 feet, coffee is cultivated. "In the most fertile parts of Java," says Crawford, "and these from the neighborhood of the high mountains are usually also the most picturesque, the scenery is at once agreeable and magnificent, and certainly for grandeur and beauty excels all that I have seen even in Italy, that country which in summer bears the nearest resemblance to Java. In such situations we have mountains 10,000 feet high, cultivated to half their height, the valleys below having all the appearance of a well watered garden, in which the fruit trees are so abundant as to conceal the closely packed villages." The mechanic arts among the Javanese are not so far advanced as their agriculture. About 30 crafts are practised among them, of which the principal are those of the blacksmith or cutler, the carpenter, the sheath maker, the

coppersmith, the goldsmith, and the potter. Bricks and tiles are largely made. The carpenters are skilful in house and boat building. They make vessels of all sizes from 50 tons down to fishing canoes, and under European superintendence build large ships. The ordinary dwellings of the people are built of a rough frame of timber, thatched with grass or palm leaves, and with walls and partitions of split bamboo. The Javanese excel all other nations of the Malay archipelago in the working of metals. They are especially skilful in the manufacture of the national weapon, the kris or dagger, which is worn by every man and boy above 14 years as part of his ordinary costume, and by many ladies of high rank. They make also excellent gongs of brass, and these with other musical instruments of the same metal have long been exported to the neighboring countries. The only native textile material woven by the Javanese is cotton, of which they make only a stout durable calico, and this is purely a domestic manufacture, carried on exclusively by the women. From raw silk imported from China, the silkworm not being reared in Java, a coarse cloth is woven also by the women. Paper of the nature of the ancient papyrus is a manufacture peculiar to the Javanese. In science the people have made little progress, possessing only a rude notion of astronomy and a slight knowledge of arithmetic. Their architecture at the present day hardly deserves the name, though the country abounds with remarkable remains of temples built many centuries ago by the ancestors of the present inhabitants. Of the other fine arts, music is the one in which they have made the greatest progress. They are passionately fond of it, and have generally fine musical ears. Their melodies are wild, plaintive, and interesting, and more pleasing to the European ear than any other Asiatic music. They have wind and stringed instruments, but their best and most common instruments are drums and gongs. In religion the Javanese are Mohammedans, which faith was established by Arab conquerors in the 15th century, and has almost entirely displaced Brahminism and Buddhism, the ancient religions of the country.—The commerce of Java is carried on chiefly through the ports of Batavia, Samarang, and Surabaya. The principal exports, with their respective values in 1856, are stated officially as follows: Coffee, \$13,510,000; sugar, \$8,500,000; rice, \$2,250,000; indigo, \$1,720,000; spices, \$525,000; tin, \$2,110,000; pepper, \$210,000; India rubber, \$195,000; birds' nests, \$250,000; total, \$29,260,000. Beside these articles, cinnamon, tea, camphor, ratans, and other products are exported in considerable quantities. The tea crop in 1859 amounted to 1,841,182 lbs.—The most important feature of Javanese society is the village, which forms a complete body politic, with considerable powers of self-government. Its officers are elected by the people, and are charged with the collection of the taxes and the maintenance of public order. The general government of the island is intrust-

ed to a governor-general, appointed by the king of Holland. He is commander-in-chief of the army and navy, and possesses nearly absolute power. Justice is administered to the European inhabitants by a supreme court at Batavia, and by 3 provincial courts at Batavia, Samarang, and Surabaya. There are beside these other courts for the Asiatic population. There are two newspapers, both subjected to a strict censorship.—The history of Java previous to the 11th century of our era is involved in fable and obscurity. It is only certain that long before that period the Javanese had acquired a considerable degree of civilization. About the 11th century, or, according to some conjectures, as early as the 6th, Java was visited by the Hindoos, either as emigrants or conquerors, who founded kingdoms and converted the natives to Brahminism. The Hindoos and their religion remained dominant in the island from the end of the 13th to that of the 15th century, when Mohammedanism, which had for a century or two been zealously propagated by Arabs, Persians, Malays, and Hindoo Mohammedans, who came as merchants or settlers, gained a complete ascendancy over Brahminism. Bantam, the last of the Hindoo states, was conquered in 1480. In about a century after this event, Java was divided into many independent states. About 1578 an ambitious chief raised himself to supreme power over nearly the whole island, and founded a dynasty which still exists in the small kingdoms which are permitted by the Dutch to remain in nominal independence. The Portuguese visited Java in 1579, and entered into commercial negotiations with the natives. The Dutch first came to Java in 1596 as traders. In 1610 they obtained permission to build a fort near the site of the present city of Batavia. They soon became involved in war with the native rulers, and in 1677 obtained a considerable territory. From that period to 1830 they carried on 4 great wars with the natives, the first of which lasted for 34 years; the second, which began in 1718, lasted for 5 years; the third, which began in 1740, for 15 years; and the fourth, which began in 1825, for 5 years. The third was begun Sept. 26, 1740, by a dreadful massacre of the Chinese settlers at Batavia, of whom 10,000 were killed in two days. In 1811 the British, being at war with Holland, then a portion of the French empire, sent a fleet and army against Java, which was conquered without much opposition and held till 1816, when it was restored to Holland. Of late years the island has rapidly advanced in population and prosperity, and it is now one of the most flourishing of European colonies. By a decree of the Dutch government, slavery was totally abolished on Sept. 20, 1859, in all their colonies in India. It had never prevailed among the native Javanese, and the number of slaves in the island amounted only to a few thousands, mostly natives of other islands of the archipelago and of Africa, and held by European masters.—Sir T. Stamford Raffles's "History of

Java" (2 vols. 4to., London, 1817) is a standard work. The natural history of Java has been treated by C. L. Blume, *Flora Javae necnon Insularum Adjacentium* (3 vols. fol., Brussels, 1826-'36), and by Dr. T. Horsfield in his "Zoological Researches in Java and the Neighboring Islands" (London, 1824). The German naturalist and explorer Junghuhn is the author of several works on the natural history and geography of Java, the most important of which was published in Amsterdam in 1850 (3d Germ. ed., Leipsic, 1852).

JAVA, LANGUAGE AND LITERATURE OF. It is not certain whether the name of Java be connected with the Sanscrit Javana and Yavana, both of which, beside being related to *Ιωννα* as names of Greece, also signify (especially the latter) Bactria, Arabia, and other foreign countries, and, moreover, swift, horse, &c.; or whether its etymon be of a different origin. As regards the affinities of the Javanese language, Roorda considers it as a branch of the Malay. Crawford derives it from the vernacular of the aborigines, to whom he attributes the primitive culture of the Malayan islands. Domeny de Rienzi supposes it to have arisen from the language of the Bugis of Celebes, by an admixture of Malay and Sanscrit. W. von Humboldt connects it, both as to words and grammar, with the Tagala, the most developed Malayan tongue of the Philippine islands, as well as with other Malay idioms and with Sanscrit. Others see in it a type of the unmixed tribes of Oceania. It certainly shows all these affinities, and contains also some Arabic elements. The Javanese is the most cultivated of all Polynesian languages, owing to the very early intercourse of the island with the continent of India, whose Aryan as well as Dravidian influence is attested by the presence of Malabaric words along with those from the Sanscrit, not only in Javanese, but also in the idioms of Sumatra, Madagascar, &c. Both religious and political revolutions have served to modify the condition of the languages.—There are four dialects, according to Raffles, on the three islands which form the linguistic group in question, viz.: 1. The tongue of the mountaineers of Sunda, in the W. part of Java, E. of Tagal, probably vernacular through this whole region before the introduction of Mohammedanism, now spoken by about $\frac{1}{10}$ of the population of the island; it contains many Malay and some Sanscrit words, stands in the same relation to the principal language as the Welsh does to the English, and is best spoken at Bantam, sluggishly at Bogor and Chianjore, and verging to the Javanese at Cheribon. 2. The Javanese proper, E. of the last named city, extending through the rest of the island, especially along its N. shore; its words are long at Tagal, shorter at Samarang, full, short, and strong at the courts of Surakarta in the centre, and Jok-jakarta in the south; it approaches the Madurese at Surabaya, and the Balian at Banyuwangi. 3. The dialect of Madura and Sumanap, which has many Sunda words, with more

of Malay, and with peculiar endings. 4. That of Bali, little different from the general Javanese. This island preserves the ancient letters as well as Brahminism, both expelled from Java in the 15th century A. D. A sort of jargon, analogous to the *lingua franca*, is spoken at Batavia, being a medley of Dutch, Portuguese, Javanese, and Malay. Along with the preceding there are also peculiar styles or idioms of speech, varying in accordance with social position and age, as the *madhjo* (intermediate), between equals; the *basa* or *bohoso-ngoko* (language popular), to inferiors; the *basa-kromo* (language superior), urbane, court idiom, about $\frac{2}{3}$ of it Sanscrit, used by poets as the speech of gods, heroes, and ghosts. As to locality, there are also two vernacular idioms, viz.: the *basa-dalam* of the interior, and the *basa-luar*, spoken along the shores.—The Kavi (learned, wise, poet) is the ancient sacred language of Java, and consists of about 6 parts of Sanscrit, less altered than in the Pali, to 4 of Javano-Malay. It owes its origin to Brahminic immigration, about the beginning of our era. It is to the Javanese what Sanscrit is to the Hindostanee, and Pali to the Indo-Chinese languages. Declining in the 14th century, it took refuge in Bali, and was imperfectly known by the Panambahan at Sumanap at the time when Raffles was in Java. Passages in the Kavi are sometimes quoted on peculiar occasions, as for instance in fables and dramas; the term itself is employed as a title of works, &c., such as *Sekar-kavi*, flowers of poetry, whence *Sekar-rini*, a Kavi meter; *Rama-kavi*, the Javanese Ramayana; *Kavindhra*, principal singer or poet (named *ma-kathā*, narrator, in Tagala). A few specimens of words may show the relation of the Javanese to the common Malay, where the difference, if not especially noted, is sometimes more in the accent than otherwise: *langit*, heaven; *tanah*, earth (Mal. also *benua*, region); *ayer* (Jav. also *banyu*), water; *laut* (Jav. *lahut*), sea; *dhina* (Mal. *hāri*), day; *bengi* (Mal. *mālam*), night; *vulan* (Mal. *bālan*), moon; *terang* (Mal. *trang*), light; *mati*, to die; *lulat* (Mal. *kāsih*), to love; *dara*, virgin; *dhēva* (Mal. *tuhan*), god, lord; *mangan* (Mal. *mākan*, *santap*), to eat; *bāpa*, *pak* (Mal. *pā*, politely *ayah*), father; *ma*, *bok* (Mal. *mā*, *amā*, politely *ibu*, *bonda*), mother, &c. Compounds and derivatives abound, but the latter are more frequently formed by suffixes than by prefixes, in which the Tagala is very rich. There are many contractions into *tr*, *ngl*, *ngr*, with the dropping of short vowels, together with the alteration of the initial sound (similarly to the Celtic), and other variations which obscure the etymic origin, thus: Sans. *nātha*, master, lord, becomes *tata*, order, to reign; Jav. *neda*, to eat, *tada*, food; *nulis*, to write, *tulis*, scripture; *nitik*, to prove, *titik*, proof. The prefix *n* denotes verbs, *t* substantives; other changes are: *nyatur*, to tell, *ekatur*, tale; *nyerrat*, to write, *scrrat*, writing, &c. The doubling of the first syllable makes verbs, as *tutulung*, to help, from *tulung*, aid; *gagriya*,

to dwell, from *griya*, house. The insertion of *in* is the sign of the passive voice. Substantives are also made by prefixing *pem* (*pen*, *pe*), denoting an agent; thus: *pem-pekto*, carrier, from *pekto*, to carry; *pen-dahar*, eater, &c.; by prefixing *ka*, a sign of the past participle: *ka-bekto*, Lat. *allatum*; by suffixing *n* (*en*, *an*): *bakt-en*, the carrying, *dahar-an*, Lat. *cibus*; and by both prefix and suffix: *ka-dahar-an*, eatable. Articles, gender, and the dual number are wanting. In the plural, cases are denoted by particles, and also by reduplication, as in the Japanese. The genitive relation is shown by the precedence of the noun or by inserting *ing*. The other relations of case are indicated by means of verbs. The adjective is unchanged after the substantive. Pronominal forms are fewer than in Malay: *kita*, we in Malay, means I in Javanese. The numerals are: 1, *sidshi*; 2, *loro*; 3, *telu*; 4, *papat*; 5, *limo*; 6, *nem*; 7, *pitu*; 8, *valu*; 9, *songgo*; 10, *sepuluh*; 11, *sawelas*; 12, *olas*, &c. Ordinals are formed by prefixing *ping* or *kaping*. The figures of numbers are modified letters. The person, number, tense, mood, and voice of verbs are indicated by certain particles. Many verbs and nouns are expressed by the same word, others are distinguished as stated above. The suffixes of the imperative are *o*, *ono*, *en*, *enno*. The following are examples of a verb in various forms: *ningngalli*, to see; passive, *dhipun tingngalli*, katingallan, &c.; *kula tingngalli*, I have seen; *badē kula tingngalli*, I shall see; *tinnvingngallam*, to see one another; *sampeyan tingngalli*, see; *kula tingngallana*, that I may see, &c. The construction is as follows:

Rama kahula kang vonten ing surga, easta andika dadā
 Father our who art in heaven, name thy be
elapienno.
 hallowed.

As regards the shape and employment of letters, the graphic system is derived from the Devanagari, but not as regards their order, which is as follows: 'ha, na, tcha, ra, ka, da, ta, sa, va, la, pa, da, dja, ya, nya, ma, ga, ba, ta, ng'a. These 20 Akshara (letters) are consonants with an adherent *a* in the general language, or *o* at the courts of princes, which, when not suppressed, gives to the syllabarium the epithet of *lagana*. As many *Pasangan* (consonants) are vowelless, 3 of them are annexed, the others subscribed to other letters. This peculiar succession of letters must have originated prior to that of the organic scheme of the Devanagari, and it is explained by its signifying: "There were two messengers, disputing, equally courageous, till both died." The *Akshara-Buddha*, being ancient, differ in form from the later *Akshara-gede*. Some Kavi letters are almost like those of the Sanscrit, while the more recent resemble the square Pali. The vowels are called *Sandang'an* (connection), viz.: *a*, *i*, *u*, *ē*, *ō* (almost French *muet*), *o*, either used as initials or (except *a*) attached to the consonants instead of the inherent *a*. The diacritic signs are analogous to those of the Devanagari. There are also characters for

the quasi-vowels *le* and *re*. The writing runs from left to right, each letter being connected with the others in words, and these following one another without any space left between them. Tradition assigns the introduction of writing as well as of Brahminism and political institutions to Aji Saya Baya.—Paleography finds a rich harvest in Java, its subjects being distributed in four classes: 1, inscriptions in ancient Devanagari near the ruins of Brambanan and Sinagasari; 2, those in square Kavi letters, from which the cursive are derived, mostly on stone and metal; 3, those in a dialect resembling the language of Sunda; 4, the *Chandra-Sungkala* (light of royal times or dates), which consist in selecting such words, symbolic of numbers, as may also express a fact that is to be recorded. Thus, for instance, the date of the destruction of Majapahit, a fact most important in Javanese history, is thus inscribed (1400, reading from right to left):

Sirna (0) *ilang* (0) *kertaning* (4) *bumi* (1)
Lost and gone (is) (the) work, (pride of the) earth (land.)

The date of certain long graves at Gresik, near the tomb of the princess of Chermi (1313), is thus written:

Kaya (3) *vulan* (1) *pūtri* (3) *iku* (1).
Like (to the) moon princess (that) was.

—The literature, which is in Kavi, dates from about the commencement of our era, and is rich, especially in legends concerning cosmogony. The subjects of the works are mostly either of a mythical or ethical character. Prominent among the former are: the *Kānda* (Sans. *Khandata*, fragment, section) *Pepakem* (book), or *Sejarah* (history); *Manek-Maya*, a mythical genesis, in which Buddhism predominates; *Vivaha-Kavi* (matrimonial poem), about a *Rasaksa* (evil spirit) who courts a *Vidaduri* (nymph); *Rama-Kavi*, the Javanese Ramayana; *Parikespit*, “Arjuna’s Grandson”; *Mintaraga*, a poem on Arjuna in the Indra mountain. This kind of compositions comes down to the time of Aji Saya Baya. Of the ethical order are the *Niti Sastra Kavi*, in the purest style, of about the 13th century; and *Śrūti*, which already alludes to Islam. But the *Brata-Yudha* (“Holy War”) is an epos mostly on the deeds of Arjuna; being an episode of the Mahabharata, in 712 stanzas, with varying rhymes. The *Sastra Menawa* is a Javanese imitation of the ordinances of the Indian Menu. Indeed, most of the Kavi works are such imitations. Whether mere versions of Sanscrit works have been made or still exist is not precisely known; but there are many Javanese versions from the Kavi. Javanese literature abounds in romantic compositions, mostly of an elegiac form. Among these, the adventures of the popular hero Pandji are most prominent. Dramas, and especially puppet shows, called *wayang* (shadows), and with figures of either leather or wood personating heroes, are popular.—See Gottl. Brückner, *Proeve eener Javaansche Spraakkunst* (Serampore, 1830); Sir T. S. Raffles, “History of Java” (London, 1830); J. F. C. Gericke, *Eerste Gron-*

den der Javaansche Taal, benevens Leer- en Leesboek, met eene Woordenlyst (Batavia, 1831-40); A. D. Cornet de Groot, *Javaansche Spraakkunst* (Batavia, 1833); P. P. Roorda, *Algemene Javaansche en Nederduitsche en Nederduitsche Javaansche Woordenboek* (Kampen, 1834); Roorda van Egsinga, *Javaansche Spraakkunst, to egelicht door autographische Tafelen* (Amsterdam, 1835); W. von Humboldt, *Ueber die Kavi-Sprache* (vol. iii., Berlin, 1836-9); A. de Wilde, *Nederlandsche Maleisch en Soendasche Woordenboek* (Amsterdam, 1841); E. Dulacrier, *Mémoires, lettres, &c.*, *relatifs au cours des langues Malaie et Javanaise* (Paris, 1843); J. T. Crawfurd, in the “Asiatic Researches” (vol. xiii., Calcutta).

JAXARTES, SIMON, SIR, or SIR-DARIA, a river of Asia, forming in the latter part of its course the boundary between Independent Tartary and western Siberia. It is formed by a number of head streams on the borders of Turkestan, its two principal constituent branches rising one on the S. side of the Kinder-tau, or W. continuation of the Alak-tagh, in lat. 42° 21' N., long. 70° E., the other on the crest of the Bolor. The stream flows W., N., and N. W., through the Khokan and Kirgheez dominions, nearly parallel to the Jihoon or Oxus, whose course is about 400 m. S. of the Jaxartes, both rivers falling into the sea of Aral, the Jihoon at its S. extremity and the Jaxartes at the N. The Jaxartes receives numerous tributaries. Its length is about 900 m.; its banks are low and subject to inundation, and it is broad and deep, but after entering the desert of Aral it gradually diminishes in bulk. A deltoid branch which it sends off, known as the Kuwan-Daria, is generally absorbed by the arid sands.

JAY, the popular name of many conirostral birds of the crow family, and sub-family *garrulinae*, inhabiting Europe, Asia and its archipelago, and America. One of the handsomest of the genera is *cyanurus* (Swains.), of which the type is the blue jay, and all the species, about 20 in number, belong to America; in this genus the head is crested, the bill rather slender and curved at the tip, which is slightly notched, the wings and tail blue with transverse black bars; the circular nostrils are concealed by bristles; the wings are rounded, with the 4th, 5th, and 6th quills the longest; tail about as long as the wings, lengthened, and graduated; the toes strong, with the hind claw large and longer than the toe. The blue jay (*C. cristatus*, Swains.) is too well known to need description; it will be sufficient to say that the general color above is light purplish blue, with the wings and tail ultramarine; the under parts are whitish, with a black crescent connected with a half collar on the neck above; beside the black bands on the wings and tail, the lateral feathers of the latter are tipped with white. This lively, impertinent, and noisy bird is one of the most graceful and beautiful inhabitants of our woods; it is found all over the United States, as far west as the Missouri, and as far north as Canada, remaining often through the winter in

New England. It has a very mischievous disposition, robbing the farmer's corn crib, sucking eggs of other birds, and tearing the young to pieces; it possesses considerable imitative power, and seems to take delight in uttering the cry of the sparrow hawk to terrify the small birds and make them rush to cover; it is very quarrelsome, and in an aviary will soon destroy other birds of its size. When eggs and tender birds fail, they eat nuts, fruits, grain, and insects; they breed in all parts of the United States, though in Florida they are in a great measure replaced by the *cyanocitta*, *Floridana*. Their usual note is a harsh scream, uttered by all in the neighborhood at the approach of any rapacious bird or quadruped or human enemy, and on this account a jay is often a nuisance to the sportsman in quest of nobler game. The length is about 12 inches, and the extent of wings 14. In *C. Stelleri* (Swains.), of the Pacific coast of North America, the bill is longer, the body blue, with head, neck, and upper part of back dull sooty black; occipital crest rather short, and with no white about the eyes.—The genus *cyanocitta* (Swains.) includes the jays without a crest, with no bands on the wings and tail, and with shorter wings. In the *C. Californica* (Strickl.) the belly and under tail coverts are dull white; in *C. Floridana* (Bonap.) the belly is brownish ash; in *C. ultramarina* (Strickl.) the blue color is very rich, with the under tail coverts white. The prevailing color is blue in all these jays. The Canada jay (*perisoreus Canadensis*, Bonap.) is about an inch less than the blue jay, of a general cinereous color above, smoky gray below, with a whitish breast and neck and brown nuchal patch. It is found throughout the northern parts of America, even into New York and New England. The habits are much the same as the blue jay, its common name of carrion bird indicating its carnivorous propensities; the young are sooty brown, and are often called "whiskey-jacks." The jay of Europe (*garrulus glandarius*, Linn.) is a handsome bird, about as long but not so thick as a pigeon, of a light reddish brown color, the fore part of the head whitish with black spots, and the feathers elongated so as to form an erectile crest; the blue wing coverts are banded with black; the quills of the wings and tail, and broad band from the base of the bill under the eye, black; the female differs but little from the male. It is common in England, southern Scotland, and temperate Europe; shy and suspicious like all the crow family, it frequents wooded districts, feeding principally on nuts, worms, and insects, in summer visiting gardens for the sake of their fruits and leguminous vegetables; it also plunders the nests of other species, and sometimes pounces on field mice and small birds. The flight is direct and quick, and performed with great dexterity through the thickets; the ordinary notes are harsh and loud; its power of imitation, especially in captivity, is considerable, embracing the sounds of birds, of domestic mammals, and of any noise

which may come to its ears. The eggs, from 5 to 7, are $1\frac{1}{2} \times \frac{5}{8}$ inch, pale bluish green, with faint freckles of purplish and yellowish brown.

JAY, an E. co. of Ind., bordering on Ohio, and drained by the head waters of Salamonie and Wabash rivers; area, 370 sq. m.; pop. in 1850, 7,047. The surface is undulating, and the soil of various qualities, but mostly fertile. The productions in 1850 were 170,455 bushels of Indian corn, 47,290 of wheat, 40,193 of oats, and 16,925 lbs. of wool. There were 5 grist mills, 3 saw mills, 9 churches, and 810 pupils attending public schools. Capital, Portland.

JAY, JONX, an American statesman and jurist, the first chief justice of the United States, born in New York city, Dec. 12, 1745, died in Bedford, Westchester co., N. Y., May 17, 1829. He was descended from Augustus Jay, a Huguenot merchant of Rochelle in France, of the Poitiers branch of the Jay family, who after the revocation of the edict of Nantes in 1685 emigrated to America, and settled first in Charleston, S. C., and afterward in New York. Peter Jay, the father of John, was a merchant, and Mary Jay, his mother, the daughter of Jacobus Van Cortlandt, was descended through her grandfather Frederic Philipse from a Bohemian family whom religious persecution had driven from home to seek refuge in Holland and afterward in America. While still an infant John Jay was removed with the rest of the family to a country seat which his father had purchased at Rye on the shore of Long Island sound. He received his early education at the grammar school of New Rochelle, and at King's (now Columbia) college, where he was graduated in 1764. Two weeks after leaving college he began to study law in the office of Benjamin Kissam, Lindley Murray, the celebrated grammarian, was at the same time studying in Mr. Kissam's office, and in his autobiography thus describes his fellow student: "His talents and virtues gave, at that period, pleasing indications of future eminence; he was remarkable for strong reasoning powers, comprehensive views, indefatigable application, and uncommon firmness of mind." In 1768 Jay was admitted to the bar, and formed a partnership with Robert R. Livingston, afterward chancellor of the state of New York. In May, 1774, he was married to Sally Livingston, daughter of William Livingston, afterward for many years governor of New Jersey. About the same time, while in the full tide of practice as a successful and popular lawyer, the revolutionary movement against the aggressions of the British government called him actively into the field of politics. Though an ardent and inflexible patriot, he was opposed to precipitate measures. While deeming the course of the British ministry unconstitutional and dangerous to the rights and liberties of his countrymen, his sentiments as to the mode of resistance and redress were of the most moderate tone. When intelligence of the passage of the Boston port bill reached New York, a meeting of the citizens was held, May 16, 1774, and

a committee of 51 formed to correspond with the other colonies. Jay was appointed a member of this committee, and at their first meeting, May 23, a sub-committee of 4 was nominated to draft an answer to the Boston committee, who had recommended the general adoption of a non-importation and non-exportation agreement until the act for blocking up their harbor was repealed. He was a member also of this sub-committee, and is supposed to have been the author of the reply to the Boston address, in which the proposition to enter into an agreement of non-intercourse was pronounced premature and inexpedient, and a general congress of the colonies recommended. Though the moderation of this document gave much offence to the more ardent patriots, the suggestion of a congress was concurred in, and Philip Livingston, Isaac Low, John Alsop, and John Jay were unanimously elected delegates to it, and were soon afterward adopted as their delegates by the city of Albany and by some towns in Westchester and Dutchess counties. The congress met on Monday, Sept. 5, 1774, at the Carpenters' hall in Philadelphia. Jay, though the youngest member but one, took a leading part in its proceedings. He was at this time strongly opposed to any attempt at independence, but desired to see the difficulties between the colonies and the mother country adjusted on terms satisfactory to both parties, and on a basis that might preclude future difficulties. When convinced, however, by the course of events, that independence had become a necessity, he embraced the measure with zeal and lent it hearty and efficient support. He participated in most of the debates that arose, and made his first speech upon the question of the mode of voting in the congress, the settlement of which upon a satisfactory basis was exceedingly difficult. The proposition that measures should be determined by the majority of votes given by individual members was met by the objection that some of the colonies had sent more than their proportion of delegates, while others had sent less. To vote by colonies was to give the 5 small colonies more power than the 4 large ones of Massachusetts, New York, Pennsylvania, and Virginia, which contained 3 times as many inhabitants. This latter proposition received Jay's support, and it was finally decided that each colony should have one voice. On the same day, Sept. 6, it was agreed that a committee should be appointed of two from each colony to state the rights of the colonies in general, the violations of those rights, and the proper mode of redress. Jay was one of the members from New York. On Oct. 11 he was appointed one of a committee of three to prepare a memorial to the people of British America and an address to the people of Great Britain. The latter document, written by Jay, was universally admired for its grave, manly, yet fervid eloquence, and it immediately gave its author a great reputation throughout the country. The address was adopted, Oct. 21, together with a memorial to the people of

British America drawn up by Richard Henry Lee; and after a busy session of 8 weeks the congress adjourned, Oct. 26. To the second continental congress, which met at Philadelphia May 10, 1775, Jay was also a delegate. He was one of a committee of three appointed to draw up an address to the people of Canada soliciting their coöperation in the contest which had now become inevitable, and the eloquent and forcible paper reported by the committee was from his pen. He also wrote an address to the people of Ireland for his father-in-law, Gov. Livingston, chairman of the committee instructed to prepare it, of which committee, however, Jay was not a member. On Sept. 22 he was appointed on a committee with Franklin, Rutledge, Randolph, and others, to consider the state of the trade of America. Their report led to an animated debate, in which Jay advocated the policy of continuing the trade with Great Britain and the British West Indies from New York, North Carolina, and Georgia, in opposition to those who maintained that, as the rest of the colonies had been excluded from this trade by the "restraining act" of parliament, the three colonies excepted should voluntarily relinquish it. Upon the question respecting the appointment of field officers for the troops to be raised in New Jersey, he was earnestly in favor of retaining the appointment in the hands of congress, instead of giving it to the provincial congress of New Jersey. The union, he said, depended much upon breaking down provincial conventions. On Dec. 4, Jay, Dickinson, and Wythe were appointed a committee to confer with the assembly of New Jersey, then in session at Burlington, and endeavor to dissuade that body from sending a petition to the king of Great Britain, a dangerously discouraging step to the cause of freedom, which the assembly had already determined upon taking. In his address to the house Jay said they had nothing to expect from the mercy or justice of Britain; that petitions were not now the means to be used, but vigor and unanimity were the only means. The petition of united America, presented by congress, ought to be relied on as sufficient, and no other was necessary. The remonstrances of the congressional committee prevailed with the assembly, and the design of petitioning the king was abandoned. As the revolutionary war advanced, congress began to look abroad for allies, and on Nov. 29, 1775, it appointed Harrison, Franklin, Johnson, Dickinson, and Jay a committee to correspond with the European friends of American liberty. A secret agent of the French government had shortly before given to a committee, consisting of Jay, Franklin, and Jefferson, certain indirect assurances that the revolted colonies might rely on receiving aid from France. The committee of correspondence at once entered into negotiations with friends of the American cause in England, France, and Holland, the result of which was that in the spring of 1776 Silas Deane was privately sent

by them as a political agent of America to the court of France. His letters from Paris were addressed to Jay, and to prevent exposure in the event of their falling into the hands of the English, they were written in invisible ink which was made legible by some chemical application. —In addition to his labors in congress, Jay was at this time much occupied with the affairs of New York, which were in a confused and unsatisfactory condition, the tories being numerous, and the provincial congress suspected of being lukewarm in the cause of freedom. The tory newspaper, Rivington's "Gazette," was the cause of much mischief and more annoyance to the patriots; and on Nov. 23, 1775, its types were carried off by a mob of troops from Connecticut. Jay was always opposed to lawless violence, and wrote to the New York congress: "I don't approve of the feat, and I think it neither argues much wisdom nor much bravery; at any rate, if it was to have been done, I wish our own people and not strangers had taken the liberty of doing it." It was difficult at this time to induce men of standing and character to accept commissions in the militia of the state. Jay, as an example to others, allowed himself to be commissioned as colonel of the second regiment of foot in the city of New York, though his duties in congress kept him from the field. In April, 1776, he was chosen a member of the provincial congress of New York, and at the special request of that body he returned from Philadelphia to assist in its deliberations. He was thus prevented from becoming a signer of the declaration of independence, which passed the continental congress while he was serving in the congress of New York. He however gave that great measure his cordial approval, and ever earnestly and steadily supported it. Of the next New York congress, or convention as it was called, he was a member, and took throughout a leading part. He served on the most important committees, and was actively engaged in taking measures to repel the incursions of the enemy up the Hudson, and to suppress the conspiracies of the tories, who were numerous in the southern part of the state, and who were greatly encouraged by the disastrous aspect of affairs on the American side. He displayed in this crisis eminent vigor, energy, and firmness. To arouse the people from the gloom occasioned by the reverses of the army, he drew up an address which was issued by the convention, Dec. 23, 1776. This admirable document, one of the ablest productions of his pen, was deemed of such importance that the continental congress specially recommended it to the perusal of the people of the United States, and ordered it to be translated into German and printed and circulated at the national expense. When the convention undertook, in Aug. 1776, to form a government for the state of New York, he was appointed one of the committee to frame a constitution and bill of rights. The report of the committee, made March 12, 1777, was written by him, and the constitution was chiefly his

work. The convention, just before its dissolution, May 13, appointed a council of safety, consisting of 15 members, of whom Jay was one. This council was invested with dictatorial powers, such as were demanded by the perilous condition of the state, of which the whole southern part was in possession of the enemy, while Burgoyne with a large army was invading it from the north. The convention also appointed Jay chief justice of the state until the legislature should meet, and the constitutional power of appointment be organized. The supreme court held its first term at Kingston, Sept. 9. The chief justice presided, and delivered a charge in which he eloquently depicted the character of the contest in which the state was engaged. On the next day the legislature met, and Jay was duly reappointed chief justice under the constitution. No account has been preserved of the nature of the causes that came before his court, nor of his decisions. In a letter written from Albany in the spring of 1778 he says: "I am now engaged in the most disagreeable part of my duty, trying criminals. They multiply exceedingly. Robberies become frequent; the woods afford them shelter, and the tories food. Punishments must of course become certain, and mercy dormant—a harsh system, repugnant to my feelings, but nevertheless necessary. In such circumstances lenity would be cruelty, and severity is found on the side of humanity."—On Nov. 4 he was elected by the legislature a delegate to the national congress, on the ground that the withdrawal of Vermont from the jurisdiction of New York furnished a special occasion for requiring his services at Philadelphia. He took his seat, Dec. 7, 1778. Three days later he was elected president of congress, Laurens, the former president, having resigned the day before. Jay filled this important post in a manner that won universal esteem for his moderation, prudence, and impartiality. On Sept. 27, 1779, he was appointed minister to Spain, and consequently resigned the presidency of congress and the chief justiceship of New York, which until then he had retained. He embarked, Oct. 26, in the frigate *Confederacy*, which was obliged by stress of weather to make for Martinique in the West Indies, whence he sailed in the French frigate *Aurora*, and reached Cadiz Jan. 22, 1780, and Madrid on April 4. His mission had two objects, to obtain a loan of \$5,000,000, and to secure the right to the free navigation of the Mississippi. The Spanish court received him coldly, and many months passed in fruitless negotiations. Congress, without waiting to hear even of his arrival in Spain, had, in desperate want of money, directed its treasurer to draw on him at Madrid for \$500,000. When these bills arrived, rather than let the credit of the country be damaged by their going to protest, he accepted them at his own risk. He afterward was enabled to meet them when due, partly by remittances from Franklin at Paris, and partly by some smaller sums reluctantly given by the Spanish government, which paltered and vacil-

lated throughout the whole affair in a way that greatly displeased the straightforward American. "The conduct of this court bears few marks of wisdom," he wrote to Franklin; "the fact is, they have little money, less credit, and very moderate talents." He quitted Madrid, May 20, 1782, and proceeded to Paris to assist in the negotiation of a treaty of peace with Great Britain, congress in 1781 having appointed him a commissioner for that purpose, together with Adams, Franklin, Jefferson, and Laurens. He arrived in Paris, June 23. Of his colleagues, Franklin alone was there, Jefferson being detained in America by the delicate health of his wife, Laurens a prisoner in the tower of London, and Adams in Holland negotiating a loan. On Franklin and Jay therefore the primary formation of the treaty devolved. Jay's share in these negotiations was marked by a resolute vigilance in maintaining the honor and interests of his country, and by an astute suspicion of the intentions of the French court in regard to the fisheries and to the boundaries of the United States, which led him to resist with firmness every attempt to induce the commissioners to accept terms less favorable to America than those finally agreed upon. To the value of his services in this important negotiation we have the testimony of Adams, who says that all his colleagues were very able and attentive, "especially Mr. Jay, to whom the French, if they knew as much of his negotiations as they do of mine, would very justly give the title with which they have inconsiderately decorated me, that of *le Washington de la négociation*; a very flattering compliment indeed, to which I have not a right, but sincerely think it belongs to Mr. Jay." Lord St. Helen's, one of the English negotiators, said long afterward, speaking of John Jay: "It was not only chiefly, but solely through his means that the negotiations of that period between England and the United States were brought to a successful conclusion."—Jay quitted Paris in May, 1784, and arrived in his native city, July 24, after an absence from it of 8 years. He was received by his fellow citizens with tokens of esteem and admiration. The freedom of the city was presented to him in a gold box, with an address by the corporation. He intended on leaving Europe to resume the practice of his profession, but on reaching New York he learned that congress had appointed him secretary for foreign affairs. He was also, in the succeeding autumn, elected by the state legislature a delegate to congress. He took his seat in congress, Dec. 6, and held it till Dec. 21, when, after some hesitation, he accepted the secretaryship for foreign affairs, and performed its duties for 5 years, till the adoption of the federal constitution in 1789. In the conflict of opinion with regard to the constitution that should be formed, Jay shared in Hamilton's preference for a strong central government. His first wish, he said in a letter to John Lowell of Massachusetts, May 16, 1785, was "to see the United States assume and merit the charac-

ter of one great nation, whose territory is divided into different states merely for more convenient government and the more easy and prompt administration of justice, just as our several states are divided into counties and townships for the like purposes." When the constitution was formed, however, he urged its adoption with earnestness and ability. He wrote in its defence in "The Federalist," in conjunction with Hamilton and Madison. In April, 1788, occurred the riot in New York, known as the doctors' mob, occasioned by violations of the grave for the purpose of procuring subjects for dissection. Several physicians had been lodged in prison to protect them from the popular fury. The mob attempted to force the prison, and were resisted by Hamilton, Jay, and a body of citizens. In the conflict that ensued Jay received a deep and dangerous wound in the temple, which confined him for some time to his bed and interrupted his contributions to "The Federalist." About the same time he was elected by a nearly unanimous vote a delegate to the New York state convention called to adopt or reject the proposed federal constitution. The convention assembled at Poughkeepsie, June 17, 1788. Of its 57 members, 46 were opposed to the constitution; but its adoption was advocated with eminent ability by Jay, Hamilton, and Robert R. Livingston, and after a warm debate of more than 5 weeks, New York gave her assent to the Union by a vote of 30 to 27. Washington was inaugurated president, April 30, 1789, but it was not till September that the acts of congress necessary to constitute the executive and judicial departments of the government were passed. Washington manifested the opinion he entertained of Jay's character and abilities by tendering him a choice of the offices in his gift. He preferred the chief justiceship of the U. S. supreme court, and was therefore nominated, and confirmed by the senate, Sept. 26, 1789. The first term of the court was held at New York in Feb. 1790. His decisions, says Mr. Flanders in his "Lives and Times of the Chief Justices," "do not enable us to judge of the extent of his juridical acquirements; nevertheless they evince a juridical faculty, a power of analysis, an aptitude for logical processes, and a ready apprehension of principles." In 1792, at the April election, Jay was the federal candidate for governor of New York, in opposition to George Clinton, the democratic candidate. The contest was conducted with zeal and bitterness. Jay received a majority of the votes, but Clinton was declared elected, the legislative committee who counted the votes rejecting on frivolous technical grounds the returns of three counties where Jay had large majorities. The federalists were greatly exasperated, and at many public meetings Jay was declared to be the rightful governor of the state, and numbers were ready to assert his claims by force. He himself, as usual, counselled moderation and forbearance and submission to the letter of the law. To his wife

he wrote: "A few years will put us all in the dust, and then it will be of more importance to me to have governed myself than to have governed the state."—In 1794 the difficulties between the United States and Great Britain, growing out of unsettled boundaries and the attacks of the latter power on American commerce, became so serious that war was imminent. To avoid this calamity President Washington resolved to send a special minister to London in hopes of bringing to an amicable arrangement the existing points of dispute. He wished to appoint Hamilton to this important office, but such was the animosity against him in the senate that his confirmation seemed dubious, and any treaty formed through his agency would be received with jealousy and disfavor. Under these circumstances Washington concluded to nominate Jay. "In point of revolutionary services," says Hildreth, "only the president himself stood upon higher ground; nor could any person except the vice-president (Adams) pretend to a place upon the same level. In lofty disinterestedness, in unyielding integrity, in superiority to the illusions of passion, no one of the great men of the revolution approached so near to Washington. Profound knowledge of the law, inflexible sense of justice, and solidity of judgment, had especially marked him out for the office which he held. Having played a very active part in a state, the seat of hostilities during the whole struggle of the revolution, he knew what war was, and dreaded it accordingly. One of the ministers who negotiated the treaty of peace, and afterward secretary of foreign affairs, he was perfectly familiar with all the grounds of controversy between the two nations. Though on questions of principle perfectly unyielding, in matters of interest and expediency he knew the wisdom of giving up a part rather than to risk the loss of the whole. The only serious objection to his appointment was his judicial station; but even that gave an additional dignity to the mission, and in a crisis so important the objection lost much of its weight." Jay's nomination was confirmed by the senate, by 18 votes to 8, the opposition being from the war party. He accepted the commission with reluctance and from a sense of duty. He was fully aware of the impossibility of negotiating a treaty that would satisfy all parties, and knew that if in the heated state of the public mind he consented to any practicable arrangement of the difficulties with Great Britain, he ran the most imminent risk of losing his popularity at home and of becoming the mark for unmeasured denunciation. The office of chief justice was exactly suited to his tastes and habits, and he was not desirous of exchanging it for the difficult embassy to England. "No appointment," he wrote to his wife, "ever operated more unpleasantly upon me; but the public considerations which were urged, and the manner in which it was pressed, strongly impressed me with the conviction that to refuse it would be to desert my duty for the sake of my ease and

domestic concerns and comforts." He embarked at New York, May 12, and reached London June 15. He was received with distinguished courtesy, and immediately entered into negotiations with Lord Grenville, the minister for foreign affairs, and a treaty was agreed upon, Nov. 19, 1794. It provided for constituting three boards of commissioners: one to determine the eastern boundary of the United States, by fixing on the river intended by the treaty of 1783 as the St. Croix; another to ascertain the amount of losses experienced by British subjects in consequence of legal impediments to the recovery of pre-revolutionary debts, that amount, when ascertained, to be paid by the United States; and a third to estimate the losses sustained by Americans from illegal captures by British cruisers, those losses to be paid by the British government. The amount subsequently recovered by Americans under this clause was \$10,345,000. The western posts occupied by the British were to be surrendered on June 1, 1796. There was to be a reciprocity of inland trade and intercourse between the North American territories of the two nations, including the navigation of the Mississippi, the British also to be admitted into all American harbors, with the right to ascend all rivers to the highest port of entry; but this reciprocity did not extend to the admission of American vessels into British North American harbors or rivers. These articles were declared to be perpetual; the following were limited to two years after the termination of the war in Europe: American vessels were to be admitted into British ports in Europe and the East Indies on terms of equality with British vessels; Americans might trade to the British West Indies in vessels not exceeding 70 tons burden, but without the right to transport from America to Europe any of the principal colonial products; British vessels were to be admitted into American ports on the same terms as the most favored nation. Privateers were to give bonds to respond in any damages they might commit against neutrals. The list of articles contraband of war was to include, beside ammunition and warlike implements, all articles serving directly for the equipment of vessels, except unwrought iron and fir plank. No vessel entering a blockaded port was to be captured unless she had first been informed of the blockade and turned away. Neither nation was to allow enlistments within its territories by any third nation at war with the other; nor were the citizens or subjects of either to be allowed to accept commissions from such third nation, or to enlist in its service. The rest of the articles were similar to these, and were intended to preserve neutrality upon the ocean, and its observance in the American ports, so that neither French nor British privateers should be exclusively favored or supplied. A provision was made for the mutual surrender of fugitives from justice charged with murder or forgery. Jay returned to New York, May 28, 1795, and was received on landing by a great concourse

of people, who escorted him to his dwelling amid the ringing of bells and firing of cannon. The treaty was submitted to the senate on June 8, and on the 24th that body advised the president to ratify it, with the exception of the articles relating to the West India trade. It was published in Philadelphia on July 2, and caused a prodigious storm of popular excitement, clamor, and misrepresentation. The outcry had begun even before its publication, on the basis of imperfect abstracts of its contents. It was vehemently denounced as a pusillanimous surrender of American rights, and a shameful breach of our obligations to France. Great meetings were held against it in all the principal cities. Copies of it were publicly burned by mobs in New York, Philadelphia, Charleston, and other places. An attempt was made at Philadelphia to burn Jay in effigy on the 4th of July, which came near producing a serious riot. Washington, unmoved by all this clamor, though, as he wrote to Randolph, he considered the crisis the most important and dangerous that had yet occurred in his administration, ratified the treaty on Aug. 14. This, however, did not quiet the agitation. Some of the Boston democrats paraded the streets of that town with an effigy of Jay, which they finally burned. They also attacked the house of a federalist editor, but were fired on and repulsed. On the other hand, the treaty, Jay's treaty as it was familiarly called, was defended with energy by the federalists. Hamilton wrote in the newspapers a series of articles in its vindication, whose eloquent ability commanded the admiration even of his enemies. Many public meetings also were held in support of the ratification of the treaty, and the Boston chamber of commerce passed a resolution in favor of it, with only one dissenting voice, while a memorial taking the same ground was numerously signed by the merchants of Philadelphia. In the house of representatives Fisher Ames made his greatest speech in defence of the treaty, and in favor of passing the laws necessary to give it effect. He said: "The honor of the United States was saved, not forfeited, by treating. The treaty itself, by its stipulations for the posts, for indemnity, and for a due observance of our neutral rights, has justly raised the character of the nation." After a long struggle the resolution that it was expedient to pass the laws necessary for carrying the treaty into effect was agreed to by a vote of 58 to 51, only 4 New England members voting against it, and from the states south of the Potomac only 4 for it. Jay himself, amid all this excitement and obloquy, preserved his equanimity, and relied upon the ultimate judgment of his countrymen. He wrote to the Rev. Dr. Thacher: "The approbation of one judicious and virtuous man relative to the conduct of the negotiations in which I was lately engaged, affords me more satisfaction than all the clamors raised on that subject by intrigue and passion have given me concern."—During his absence in England his friends had put

him in nomination as candidate for governor of New York, without his knowledge or consent. He was elected by a large majority, and the result was officially declared two days before he reached New York. The term of service being then 3 years, his administration, by reflection, lasted 6 years, during which time he dismissed no one from office on account of his political opinions. On one occasion he was urged to remove a member of his own party who had no influence, to make room for one of the opposite party who had much influence, and, if appointed to the office in question, would exert himself in Jay's behalf. "And do you, sir," said the governor to the person who proposed this, "advise me to sell a friend that I may buy an enemy?" In 1799 the legislature passed an act for the gradual abolition of slavery, a measure which Jay had much at heart. He had strenuously urged in 1777, upon the convention which formed the constitution of New York, the insertion of an article recommending the future legislature to take effectual measures to abolish slavery, "so that in future ages every human being who breathes the air of this state shall enjoy the privileges of a freeman." In a letter written while in Spain in 1780 to Egbert Benson of New York, he said: "An excellent law might be made out of the Pennsylvania one for the gradual abolition of slavery. Till America comes into this measure, her prayers to Heaven for liberty will be impious. This is a strong expression, but it is just. Were I in your legislature, I would prepare a bill for the purpose with great care, and I would never cease moving it till it became a law, or I ceased to be a member. I believe God governs the world, and I believe it to be a maxim in his, as in our court, that those who ask for equity ought to do it." In 1785 he became the president of a society formed in New York "for promoting the manumission of slaves, and protecting such of them as have been or may be liberated." He continued at the head of this society till he became chief justice of the United States, when, thinking it possible that questions might be brought before him in which the society was interested, he deemed it proper to dissolve his official connection with it. In Nov. 1800, as the end of his second term approached, he was solicited to become a candidate for reelection. He declined, declaring that he had determined to renounce public employment and spend the rest of his days in retirement. A little more than a month later, in December, he was nominated by the president and confirmed by the senate to his former favorite office, the chief justiceship of the United States, made vacant by the resignation of Oliver Ellsworth on account of ill health. He firmly declined the honor, and at the age of 56 bade adieu for ever to public life. He retired to his paternal estate at Bedford, comprising 800 acres in a secluded part of Westchester co., 50 miles from New York. Here he lived for 29 years in the serene enjoyment of domestic and rural pursuits, interrupted only by

the death of Mrs. Jay in 1802. "He was very regular and exact in all his habits," says Mr. Flanders. "He rose with the sun, had his meals served with punctuality, and passed most of the day in the open air and on horseback. Family worship was regularly observed, morning and evening, and was neither postponed nor suspended from the presence of company. He usually retired to rest about ten." Jay himself, writing to a friend, says: "I attend every election even for town officers, and, having delivered my ballot, return home without having mingled in the crowd or participated in their altercations. The fact is, that I live very much as I have long wished to do. I have a pleasant situation and very good neighbors. I enjoy peace and a competency proportionate to my comforts and moderate desires; with such a residue of health as, while it constantly whispers *memento mori*, still permits me to see my friends with cheerfulness and pleasure." He took great interest in the religious movements of his day, and was president of several religious societies. He was a member of the Episcopal church, but when applied to readily contributed to the erection of churches of other denominations. In 1827 he was seized with a severe illness, and, after two years of weakness and suffering, was struck with palsy, May 14, 1829, and died 3 days afterward. He is thus described by Mr. Sullivan as he appeared at the age of 44: "His height was a little less than 6 feet; his person rather thin, but well formed. His complexion was without color, his eyes black and penetrating, his nose aquiline, and his chin pointed. His hair came over his forehead, was tied behind, and lightly powdered. His dress black. The expression of his face was exceedingly amiable. When standing, he was a little inclined forward, as is not uncommon with students long accustomed to bend over a table. His manner was very gentle and unassuming." This description is said to be accurate, with the exception that his eyes were blue instead of black. In character Jay was eminent for the elevation and purity of his principles and conduct both in public and in private life. He was modest, claimed no merit, assumed no importance, and seldom alluded to the great events of his life. He had a high sense of justice and of humanity, and a profound feeling of religion. He was tenacious in his friendships and in his convictions. Having once had good cause to doubt a man's integrity, he never after trusted him. His disposition was cheerful, and his conversation instructive and entertaining. His mind was vigorous, exact, and logical, and characterized rather by judgment and discrimination than by brilliancy. The Bible was his constant study, and Cicero his favorite author. His public reputation as a patriot and statesman of the revolution was second only to that of Washington, and his private character as a man and a Christian is singularly free from stain or blemish.—WILLIAM, an American jurist and philanthropist, son of the preceding, born in New York,

June 16, 1779, died at Bedford, N. Y., Oct. 14, 1858. He received his early education at Albany, and was graduated at Yale college in 1807. He studied law at Albany, but having injured his eyes by intense study was compelled to relinquish the practice of the profession and to retire to Bedford, where he assisted in the management of the large landed estate, which descended to him on the death of his father in 1829. In 1815 he began that active career of philanthropic effort in which he continued till his death. He was one of the principal founders of the American Bible society, and was its recognized champion against the attacks of Bishop Hobart and other members of the Episcopal church, to which Jay himself belonged, during a controversy which lasted many years, and excited a wide interest. As president of the Westchester Bible society he delivered a long series of annual addresses. He was an early and consistent advocate of the temperance reform, for the promotion of which he organized a society in 1815. He also took an active part in the tract, missionary, and educational movements of the day, and was frequently president of the Sunday school and agricultural societies of his county. In 1818 he was appointed a judge of the court of common pleas, and in 1820 was made the first judge of Westchester co., which office he held till 1842, when he was superseded on account of his anti-slavery opinions. His opinions in relation to duelling, intemperance, prize fighting, and the abolition of slavery in New York, were freely expressed in his judicial charges; and in 1835, when the legislature had in contemplation a law restricting freedom of speech on the subject of slavery, he advised the grand jury that it would be the duty of every citizen to resist such a law as a violation of the constitution. In 1835 Judge Jay, on behalf of the executive committee of the American anti-slavery society, prepared in reply to the current charges against the abolitionists a vindication of their principles, in which he said: "We have uniformly deprecated all forcible attempts on the part of the slaves to recover their liberty;" denied that they had employed agents in the South, and disclaimed all wish for the dissolution of the Union. In the same year he published a work entitled "An Inquiry into the Character of the American Colonization and Anti-Slavery Societies," which passed through several editions in this country, and was republished in England with a preface by the Rev. Dr. Morrison. In 1838 he published "A View of the Action of the Federal Government in behalf of Slavery." His opposition to slavery was strongly manifested throughout his life, and by his will he left a special bequest of \$1,000 for "promoting the safety and comfort of fugitive slaves." In 1843-'4 he visited Europe, and proceeded thence to Egypt, where he made the acquaintance of Sir Gardner Wilkinson, in conjunction with whom he investigated the subject of Egyptian slavery. Judge Jay was for some years pres-

ident of the American peace society, and in 1848 published a volume entitled "War and Peace: the Evils of the First, with a Plan for suppressing the Last," which was reprinted by the London peace society. His plan consisted in treaty stipulations for the settlement of differences by arbitration. The committee on foreign relations of the U. S. senate, to whom a memorial on the subject was referred, reported in favor of his plan; and Mr. Cobden wrote to him: "If your government is prepared to insert an arbitration clause in the pending treaties, I am confident that it will be accepted by our negotiators." His publications on all subjects were 43 in number, many of which were widely circulated, and exercised much influence on public opinion. His largest work was the "Life and Writings of John Jay" (2 vols. 8vo., New York, 1833). "In his private character," said the New York "Evening Post," in noticing his death, "Mr. Jay was an example worthy of all imitation—a model of personal excellence. In public life he was one of the purest and most conscientious men of the country, abhorring the very shadow of indirection. He was an able judge, and as a controversialist he showed a skill which made it unpleasant to measure weapons with him." A memoir of him is in preparation (1860) by his son, John Jay.

JAY, WILLIAM, D.D., an English dissenting divine and writer, born in Tisbury, Wiltshire, May 8, 1769, died in Bath, Dec. 27, 1853. The son of a stone-cutter, he began life as his father's apprentice, and was employed in building Beckford's mansion at Fonthill. His talents attracted the attention of the Rev. Cornelius Winter of Marlborough (dissenting) academy, under whose protection and direction he prepared for the Congregational ministry. His first important sphere of labor was at Hope chapel, near Bristol. From thence he removed in 1789 to Argyle chapel in Bath, where he officiated till 1852. As a preacher he not only enjoyed a high celebrity in his own denomination, but won the applause of critics like John Foster, Sheridan, and Beckford. His published sermons are esteemed as well for their catholic spirit as their practical earnestness and simplicity of style. They have passed through several editions, and beside them he wrote an "Essay on Marriage," "Memoirs of the Rev. Cornelius Winter," "Memoirs of the Rev. John Clark," "Lectures on Female Scripture Characters" (1854), "Morning and Evening Exercises" (4 vols., 1854). His earlier works were collected in 12 vols. (Bath, 1845-'9; republished in 3 vols., New York). In 1841, at the jubilee of his settlement in Bath, a salver and £650 were presented to him. His autobiography, drawn up for his children in the form of letters, and with a supplement by the editors, the Rev. Dr. Redford and the Rev. J. A. James, appeared in 1854.

JAYADEVA, a Hindoo poet, who lived about the middle of the 12th century. The only poem of his extant is that in honor of the Hindoo deity Govinda, or Krishna. It is a species

of pastoral drama, in which the loves of the god and his innamorata Râdhâ are described in very impassioned language. There is an English translation of it by Sir William Jones.

JAZIKOFF (properly YAZIKOFF), NICOLAI, a Russian poet, born in Simbirsk about 1805, died in Moscow, Jan. 7, 1847. He studied at Dorpat, established himself at Moscow as teacher in 1823, and subsequently served in the public survey office of the latter city. Having resigned his situation, he lived for some time in his native town, and toward the close of his life in Germany. Among his best productions are the "Glow-bird," the "Earthquake," and various "Psalms."

JAZYGES, or IAZYGES, a tribe belonging to the numerous nationalities comprehended during the earlier period of the Roman empire under the name of Sarmatians, dwelt originally on the northern shores of the Black sea and sea of Azof. In the time of the emperor Claudius they emigrated westward and established themselves in Dacia in the neighborhood of the Quadi, with whom they formed an alliance, and together with whom they frequently attacked the Roman provinces on the Danube. In the 5th century they were conquered by the Goths, and subsequently disappeared as a people, being lost chiefly among the Magyars, the new conquerors of their western home. They, however, reappeared as a Magyarized tribe (Hun. *Jászok*) at a later period, when their possessions between the Danube and Theiss formed a separate central district of Hungary under the name of Jazygia (*Jászság*). This fertile region was united with Cumania, and was, down to 1849, under the special administration of the palatine, who also bore the title of captain of the Jazyges and Cumanians. It now belongs to the circle of Pesth; capital, Jászberény.

JEAN DE MONTFORT. See MONTFORT.

JEAN SANS PEUR. See BURGUNDY.

JEBAIL, DJEBAIL, or DJEBEL, a town of Syria, built on an eminence near the Mediterranean, at the foot of Mt. Lebanon; pop. about 600. It is walled on the land side, contains large gardens, a strongly built castle, an old Maronite church, and a mosque. It is supposed to be the Byblus of the ancients, often mentioned as a city of Phœnicia, between Tripolis and Berytus, the modern Tarablus and Beyroot. In the Scriptures it is called Gebal, a word signifying mountain. Its territory is called the land of the Glibites (Josh. xiii. 5); and its inhabitants are mentioned among the builders of the Phœnician king Hiram, who assisted King Solomon in building the temple of Jerusalem. In the English Bible they are spoken of as stone squarers (1 Kings v. 18). Its elders and wise men are mentioned as calkers of Tyre, in the time of its glory (Ezek. xxvii. 9). It is said to be the birthplace of Adonis. The harbor of Jebail was destroyed during the wars of the crusaders, who captured the town and kept it as long as they maintained their power in Syria. —Another Gebal is mentioned in the Scriptures,

a mountainous region S. of the Dead sea, the Djebál of the Arabs, the Gebalene of the Greeks, and probably the Syria Sabal of the crusaders.

JEDDO. See YEDDO.

JEFFERSON, the name of 19 counties in the United States. I. A N. E. co. of N. Y., bordering on Lake Ontario and the river St. Lawrence; area, 1,868 sq. m.; pop. in 1855, 65,420. The land rises gradually from the lake to a height of 1,000 feet. There are low ridges in the N. E. parallel with the St. Lawrence, and marshes in the S. W. The soil is mostly very fertile. The productions in 1855 were 321,779 bushels of Indian corn, 498,659 of wheat, 456,231 of oats, 99,391 of rye, 392,684 of barley, 289,031 of potatoes, 28,995 lbs. of hops, 3,949,608 of butter, 2,819,459 of cheese, and 98,575 tons of hay. There were 48 grist mills, 101 saw mills, 10 furnaces, 19 tanneries, 373 school houses, 4 newspaper offices, and 127 churches. Iron ore, lead, and copper are found in the county. Value of real estate in 1858, \$13,047,672. Capital, Watertown. II. A W. co. of Penn., drained by Mahoning and Red Bank creeks; area, 950 sq. m.; pop. in 1850, 13,518. The surface is hilly and well timbered, and the soil generally fertile. Iron ore and anthracite coal are abundant. The productions in 1850 were 53,877 bushels of Indian corn, 76,999 of wheat, 145,828 of oats, 9,116 tons of hay, and 147,316 lbs. of butter. There were 76 saw mills, 18 grist mills, 3 iron foundries, 37 timber yards, 2 newspaper offices, 18 churches, and 2,837 pupils attending public schools. Capital, Brookville. III. A N. E. co. of Va., separated from Md. by the Potomac river, bounded N. W. by Opequan creek, and intersected by the Shenandoah; area, 260 sq. m.; pop. in 1850, 15,357, of whom 4,341 were slaves. It has a rolling surface and a fertile soil resting on a bed of limestone. The Blue Ridge lies on the S. E. border of the county. The productions in 1850 were 287,395 bushels of Indian corn, 472,008 of wheat, 5,558 tons of hay, and 130,198 lbs. of butter. There were 23 grist mills, 7 cotton and woollen factories, 20 churches, and 1,000 pupils attending public schools. The Baltimore and Ohio and the Winchester and Potomac railroads pass through the county. Capital, Charlestown. IV. An E. co. of Ga., intersected by Ogeechee river and Brier creek; area, 634 sq. m.; pop. in 1852, 9,279, of whom 6,084 were slaves. It has a level surface, and contains burlstone, agates, chalcedony, and carnelian. The soil was originally fertile. The productions in 1850 were 354,836 bushels of Indian corn, 61,841 of sweet potatoes, and 10,441 bales of cotton. There were 20 grist mills, 7 saw mills, 15 churches, and 196 pupils attending public schools. Value of land in 1856, \$1,522,892. The central railroad passes through the county. Capital, Louisville. V. A N. co. of Fla., bordering on Ga. and Appalachee bay, and bounded E. by the Ocilla river; area, 702 sq. m.; pop. in 1850, 7,718, of whom 4,938 were slaves. The surface is undulating and the soil fertile. The produc-

tions in 1850 were 275,477 bushels of Indian corn, 74,283 of sweet potatoes, 116 hhd. of sugar, and 56,205 lbs. of rice. There were 2 grist mills, 3 saw mills, 15 churches, and 172 pupils attending public schools. Capital, Monticello. VI. A central co. of Ala., drained by Black Warrior and Cahawba rivers; area, 1,040 sq. m.; pop. in 1850, 8,989, of whom 2,267 were slaves. It has a hilly surface and a fertile soil. Coal, iron, and timber are abundant. The productions in 1850 were 342,743 bushels of Indian corn, 45,022 of sweet potatoes, and 2,451 bales of cotton. There were 18 churches, and 350 pupils attending public schools. Capital, Elyton. VII. A S. W. co. of Miss., separated from La. by the Mississippi river; area, 630 sq. m.; pop. in 1850, 13,193, of whom 10,493 were slaves. It has a fertile soil, and the E. part is occupied by pine woods. The productions in 1850 were 417,745 bushels of Indian corn, 14,035 of oats, 77,129 of sweet potatoes, and 16,193 bales of cotton. There were 2 newspaper offices, 14 churches, and 181 pupils attending public schools. Capital, Fayette. VIII. A S. E. parish of La., extending from Lake Pontchartrain to Barataria bay, and crossed by the Mississippi; area, 384 sq. m.; pop. in 1855, 14,152, of whom 4,107 were slaves. The surface is level and partly occupied by marshes and lakes. The soil is fertile. The productions in 1855 were 23,400 bushels of Indian corn, 7,495 bbls. of molasses, and 3,347 hhd. of sugar. Value of real estate, \$7,679,502. Capital, Lafayette. IX. An E. co. of Tex., separated from La. by Sabine river, bounded N. E. by the Neches, and S. by the gulf of Mexico; area, 1,481 sq. m.; pop. in 1858, 1,816, of whom 351 were slaves. The surface consists chiefly of vast savannas, which pasture large herds of horses and cattle. The productions in 1850 were 16,545 bushels of Indian corn, 9,758 of sweet potatoes, and 18,900 lbs. of rice. Stock raising is the principal employment of the population. Capital, Beaumont. X. A central co. of Ark., traversed by Arkansas river, which is here navigable by steamboats; area, 1,260 sq. m.; pop. in 1854, 6,879, of whom 3,334 were slaves. The surface is level and the soil fertile. The productions in 1854 were 244,263 bushels of Indian corn, 879 of wheat, 3,400 of oats, and 12,130 bales of cotton. Capital, Pine Bluff. XI. An E. co. of Tenn., bounded N. W. by Holston river and drained by the French Broad; area, 356 sq. m.; pop. in 1850, 13,204, of whom 1,628 were slaves. It has a hilly and well wooded surface, and contains iron ore. The soil is fertile. The productions in 1850 were 659,187 bushels of Indian corn, 192,469 of oats, 40,426 of wheat, and 101,632 lbs. of butter. There were 50 grist mills, 11 saw mills, 22 churches, and 3,000 pupils attending public schools. The E. Tennessee and Georgia railroad passes through the county. Capital, Dandridge. XII. A N. co. of Ky., separated from Ind. by the Ohio river; area, 330 sq. m.; pop. in 1850, 59,829, of whom 10,911 were slaves. The surface is

highly diversified and the soil very fertile. The productions in 1850 were 983,429 bushels of Indian corn, 92,809 of wheat, 128,522 of oats, and 120 tons of hemp. There were 17 churches, and 2,789 pupils attending public schools. Capital, Louisville. XIII. An E. co. of Ohio, separated from Va. by the Ohio river; area, 396 sq. m.; pop. in 1850, 29,132. The surface is uneven, the soil extremely rich, and coal abundant. The productions in 1850 were 582,844 bushels of Indian corn, 411,905 of wheat, 369,240 of oats, and 15,495 tons of hay. There were 6 newspaper offices, 67 churches, and 2,645 pupils attending public schools. The Cleveland and Pittsburg and the Steubenville and Indiana railroads pass through the county. Capital, Steubenville. XIV. A S. E. co. of Ind., separated from Ky. by the Ohio river; area, 362 sq. m.; pop. in 1850, 23,916. It has a diversified surface and a rich soil. The productions in 1850 were 549,471 bushels of Indian corn, 58,659 of wheat, 98,664 of oats, and 8,944 tons of hay. There were 4 newspaper offices, 79 churches, and 4,679 pupils attending public schools. The Madison and Indianapolis railroad passes through the county. Capital, Madison. XV. A S. co. of Ill., drained by the head streams of Big Muddy river; area, 576 sq. m.; pop. in 1855, 10,258. The surface is diversified by prairies and tracts of timber, and the soil is moderately fertile. The productions in 1850 were 302,944 bushels of Indian corn, 38,707 of oats, 3,965 of wheat, 73,443 lbs. of butter, and 14,027 of wool. There were 14 grist mills, 2 saw mills, 21 churches, and 2,274 pupils attending public schools. Capital, Mount Vernon. XVI. An E. co. of Mo., separated from Ill. by the Mississippi river, and drained by Big river; area, 500 sq. m.; pop. in 1856, 8,507, of whom 452 were slaves. The surface is diversified, and the soil is of various qualities. Rich mines of lead are worked, and copper and cobalt are also found. The productions in 1850 were 289,116 bushels of Indian corn, 17,322 of wheat, 35,441 of oats, and 751 tons of hay. There were 9 grist mills, 4 saw mills, 5 churches, and 281 pupils attending public schools. The St. Louis and Iron Mountain railroad passes through the county. Capital, Hillsborough. XVII. A S. E. co. of Iowa, drained by Skunk river and Big Cedar creek; area, 380 sq. m.; pop. in 1859, 14,478. The surface is occupied by rich rolling prairies and forests of oak, ash, hickory, maple, &c. The productions in 1859 were 515,679 bushels of Indian corn, 22,618 of wheat, 4,113 of oats, 13,672 of potatoes, 21,810 tons of hay, 242,042 lbs. of butter, 30,537 of wool, and 6,692 galls. of molasses. Capital, Fairfield. XVIII. A S. E. co. of Wis., drained by Rock, Crawfish, and Bark rivers, and by Koshkonong lake, an expansion of Rock river; area, 576 sq. m.; pop. in 1855, 26,869. The surface is generally level or undulating, and is well timbered, particularly in the E. part. The soil is good, the valley of Rock river being of remarkable fertility. The productions in 1850 were 81,079 bushels of Indian corn, 182,545 of

wheat, 117,894 of oats, 60,922 of potatoes, 14,296 tons of hay, and 190,820 lbs. of butter. There were 6 grist mills, 17 saw mills, 2 newspaper offices, 18 churches, and 3,111 pupils attending public schools. Capital, Jefferson. XIX. A W. co. of Washington territory, bounded E. by Puget sound and N. by the strait of Juan de Fuca; area, about 2,400 sq. m. The W. part is mountainous, Mt. Olympus lying on the boundary line; the E. consists chiefly of a large island formed by Puget sound and Hood's canal, and deeply indented by numerous inlets. Capital, Port Townsend.

JEFFERSON, THOMAS, 3d president of the United States, born at Shadwell, Albemarle co., Va., April 2, 1743, died at Monticello, July 4, 1826. His father was Col. Peter Jefferson, a planter of great force of character and high position; his mother, Jane Randolph, daughter of Isham Randolph of Dungeones in Goochland. At 5 years of age he was placed at an English school, and at 9 commenced the study of Greek, Latin, and French under Mr. Douglass, a Scottish clergyman. Upon his father's death in 1757, he was sent to the classical school of the Rev. Mr. Maury, where he continued for two years, passing thence at the age of 17 to the college of William and Mary at Williamsburg. It was on his way thither, in the spring of 1760, that he met at the house of Col. Dandridge, in Hanover, a bankrupt merchant whose "passion was fiddling, dancing, and pleasantries." Thus commenced the acquaintance between Thomas Jefferson and Patrick Henry, who were to afford each other such efficient aid in the great struggle on the floor of the house of burgesses. The young man soon became popular with his companions and the college professors, from the courtesy and cordiality of his manners. He is described at this time as ardent and impulsive in demeanor, with a tall, thin, and angular person, ruddy complexion, red hair, and bright gray eyes flecked with hazel. Among the friends whom he made were Francis Fauquier, the popular governor of the colony, and Dr. William Small, the learned and virtuous professor of mathematics in the college. To these was afterward added George Wythe, an eminent counsellor, and the 4 persons made a *partie quarrée*, we are told, at the governor's table. The society of these distinguished gentlemen exerted a powerful influence upon the mind and opinions of the youth. His subsequent scepticism was supposed to have originated from his intimate association with the accomplished free-thinker Fauquier. He was equally welcome elsewhere in the polite circles of Williamsburg, then noted for its brilliant society; and his early letters describe in entertaining terms a love disappointment with one of the young ladies of the place. These pursuits did not, however, withdraw his mind from study. He was far from idle. For a portion of the time, at least, he studied not less than 15 hours a day, his only relaxation being a quiet walk at twilight. The fondness which he

acquired at this period for the Latin, Greek, and Italian classics clung to him throughout life. He read few volumes of poetry or fiction; but Macpherson's *Ossian*, then recently published, became a great favorite with him. His admiration for the "rude bard of the north" led him to send to Europe for a Gaelic grammar and dictionary, that he might read in the original the works of "the greatest poet that had ever existed." As late as 1782 he and the marquis de Chastellux, with a punch bowl between them at Monticello, contended which should repeat to the other his favorite passages. He continued two years at college, and then commenced the study of law in the office of George Wythe. In May, 1765, while still a student, he was present in the house of burgesses when Patrick Henry delivered his celebrated speech in opposition to the stamp act, the debate upon which he declares to have been "most bloody." In 1767, under the auspices of his friend and instructor Mr. Wythe, he commenced the practice of law at the bar of the general court. He attended also the county courts of his district. The extent of his legal attainments at this time has never been clearly ascertained. He is said to have been but slightly acquainted with the practice of the profession, and an infrequent speaker. His subsequent career, however, as a legislator and reviser, would seem to indicate a broad and firm foundation, early laid, in the theory and spirit of the science. His success was gratifying. During the first two years of his practice he was employed in about 200 suits, his fees amounting to at least £600, at a time when fees were very moderate. The record of the two succeeding years shows a regular increase, and in 1771 his rank at the bar is sufficiently established by the fact that Robert Carter Nicholas, an eminent lawyer, intrusted to him all of his unfinished business.—But the courts were not to monopolize his talents. He was soon called upon to enter the public service; and on the political arena he continued with intervals for about 40 years. In 1769, at the age of 26, he was chosen to represent his county in the house of burgesses. The period was a critical one. Henry's grand oratory 4 years before had opened the eyes of the people to the nature of the crisis in public affairs; and though the stamp act had been repealed in the succeeding year, the general agitation had not subsided. In 1767 the act imposing duties upon tea, glass, paper, and other articles imported into the colonies, had excited renewed opposition, and this spirit grew every day more determined. Fauquier had been succeeded by Lord Botetourt, and the assembly of 1769 was the first which he had summoned. Jefferson drafted the resolutions to be used as heads in framing a reply to the governor's address; and the house then proceeded to pass other resolutions in opposition to taxation without representation in parliament, to the transportation over seas of persons accused in the colonies, and to other wrongs and grievances. This action of the bur-

gesses occasioned their dissolution by Lord Botetourt; but the members, meeting in the "Apollo room" of the Raleigh tavern, opposed to the dissolution a non-importation agreement which was signed by all present, including Jefferson. At this his first session he introduced a bill empowering the owners of slaves to manumit them if they thought proper. The bill was however defeated, and its policy not fully embraced until 1782. Jefferson returned to his practice, and in the following year removed from Shadwell to a new residence but partially finished, which afterward became famous as "Monticello." On Jan. 1, 1772, he was married to Mrs. Martha Skelton, widow of Bathurst Skelton, and daughter of John Wayles, an influential lawyer of Charles City. This lady, then 23 years of age, and remarkable for the beauty of her person and the grace of her manners, brought him a very considerable fortune. She had inherited 135 slaves and 40,000 acres of land, the value of the whole being about equal, we are informed, to Jefferson's own patrimony. The two combined formed an ample estate, and Jefferson's practice added largely to his income. He continued to labor at his profession, and to represent his county in the house, the country remaining dormant in political affairs until the spring of 1773. At this session the house of burgesses appointed the celebrated "committee of correspondence and inquiry for the dissemination of intelligence between the colonies." Massachusetts had already appointed a similar body to correspond with the counties and townships of that colony; but it is now conceded that the Virginia committee was the first intrusted with the duty of communicating with the provinces generally. This powerful political engine was devised by Patrick Henry, the two Lees, Dabney Carr, and Jefferson, at a private meeting in the Raleigh tavern. There is some ground to suppose that Jefferson conceived the plan, from the fact that his associates, in spite of his inferior powers as a speaker, and their own distinction, appointed him to move the resolutions in the house. He however declined in favour of his young brother-in-law, Carr. The resolutions were passed, and Jefferson was placed upon the committee. Lord Dunmore, who had succeeded the amiable Botetourt in the preceding year, immediately dissolved the body; but they were unanimously reelected by the people, and resumed their seats in the spring of 1774. Jefferson was at his post, and assumed his place among the leading men. An opportunity for exhibiting the temper of the body soon occurred. News arrived of the passage of the Boston port bill, closing Boston harbor on June 1, as a punishment for the destruction of the tea in the preceding December. Jefferson and a few associates met privately in the council chamber, and drafted a resolution proposing that June 1 should be observed throughout the colony as "a day of fasting, humiliation, and prayer." The burgesses promptly passed the resolution; the governor as promptly dissolved them; and they "retired

to the Apollo as before." The result of the meeting exhibited the advance in public opinion. The counties were recommended to elect deputies to assemble in convention on Aug. 1, and the committee of correspondence was directed to propose to all the colonies a "general congress" to meet annually and consult upon the public welfare. June 1 was observed throughout the colony, the people attending church in mourning, and listening to patriotic sermons. The deputies were also elected for the convention in August, and Jefferson was chosen from his county, but was taken sick just before the assembling of the body, and could not attend. He had however drawn up a paper to serve for instructions to the delegates who were to be appointed to the congress, and this he sent to Peyton Randolph, the president of the convention. The document was afterward ordered by the burgesses to be printed under the title of "A Summary View of the Rights of British America," and, as Jefferson believed, procured the enrolment of his name on a bill for treason brought into parliament. It was a bold, elaborate, and eloquent exposition of the right of the colonies to resist taxation, and contained the germ of the subsequent declaration of independence. It is worthy, from this fact, of some attention. The king must be informed, it declares, that the colonies demand rights instead of asking favors. The monarch is "no more than the chief officer of the people," and government was "erected for their use, and consequently subject to their superintendence." The Americans had "departed from a soil in which chance, not choice, had placed them," and had established new societies "at the expense of individuals and not of the British public." In spite of this, the country had been partitioned out to worthless favorites, and burdened with oppressions by a tyrannical parliament which had no color of right to impose taxes upon them. In relation to the act for transporting accused persons to England, the writer exclaims: "The cowards who would suffer a countryman to be torn from the bowels of their society, in order to be thus offered a sacrifice to parliamentary tyranny, would merit that everlasting infamy now fixed on the authors of the act." Against this and all other acts of oppression "we do, on behalf of the inhabitants of British America, enter this our solemn and determined protest. . . . They know and will therefore say that kings are the servants, not the proprietors of the people. . . . The whole art of government consists in the art of being honest. . . . This, sire, is the advice of your great American council, on the observance of which may perhaps depend your felicity and future fame, and the preservation of that harmony which alone can continue both to Great Britain and America the reciprocal advantages of their connection. . . . The God who gave us life gave us liberty at the same time; the hand of force may destroy but cannot disjoin them. This, sire, is our last, our

determined resolution." The paper was offered, but did not pass the house, being regarded as too much in advance of public sentiment. That the action of the burgesses was prudent, Jefferson himself afterward acknowledged. He says that in the great army of patriots it was difficult "to keep front and rear together." "Tamer sentiments were preferred," he adds, "and I believe wisely preferred." Of this there can be little doubt. The people were not yet ripe for resistance by force, and even the leaders were convinced of the possibility of renewing the old amicable relations with Great Britain. Such a restoration of good feeling was warmly hoped for by the planters generally. They were men of wealth and ease, members of the English establishment, with a multitude of ties of blood and feeling drawing them toward the mother country. They cheerfully acknowledged their allegiance to the king, and had parliament relinquished the attempt to legislate upon American affairs, the rupture between the two countries would not then have taken place. A "redress of grievances" was all that the foremost leaders aimed at thus early. The tone of the appeal for redress was the point at issue. The majority advocated respectful petitions, protests, and memorials, to king, parliament, and people. The minority approved of a bolder form of address—of demanding as a right what had so long been asked as a favor. The majority slowly came to the minority. "Front and rear" were kept together by the moderation of the other great leaders, Pendleton, Nicholas, Peyton Randolph, and the rest; thus the column of resistance advanced regularly, without break in the ranks. The "Summary View" was printed in England as well as in Virginia, and extensively made use of by opposition speakers in parliament. Thus the paper was not without direct influence on the general aspect of affairs. It was the outspoken protest of a man of America, if not of any legislative body; its cogent reasoning was supported and opposed, and visited with mingled denunciation and applause. Its influence upon the fortunes of Jefferson was marked. It placed him before the public as a courageous and uncompromising advocate of constitutional freedom, and above all as a most accomplished and eloquent writer. The effect of this latter reputation will soon be seen. The convention renewed the non-importation agreement, and after appointing delegates to the general congress in Philadelphia adjourned. The congress met, but adjourned without decisive action. The day of respectful protests and humble memorials had not yet passed away. With the spring of 1775, however, many circumstances indicated the approaching conflict. The second Virginia convention met in March at St. John's church in Richmond. John Walker and Thomas Jefferson were delegates from Albemarle county. The great incident of this convention was the speech of Patrick Henry upon arming and embodying the militia. The measure was opposed by many of

the members, but Henry's passionate exclamation: "Give me liberty, or give me death!" still rang in every ear, and his proposition was triumphantly passed. Jefferson fully approved it, and was placed upon the committee to report a plan of defence, which was soon drawn up. The convention then proceeded to elect delegates to congress, and Jefferson was chosen as the alternate of Peyton Randolph, who might be retained by his office of president of the house in Virginia. This became the case when Dunmore summoned the burgesses to meet on June 1. Jefferson was present, and at the request of his associates drew up before leaving Williamsburg the reply of the Virginia assembly to Lord North's "conciliatory proposition." This bold and forcible paper he carried with him to Philadelphia soon afterward.—Great events of recent occurrence made the action of this congress a subject of the deepest anxiety and the utmost importance. The royal governors had in April by a concerted movement removed the powder of the colonies from the public magazines. The result in Virginia was the march of Patrick Henry upon Williamsburg at the head of an armed force, which compelled the restitution of the stores; in Massachusetts, the battles of Lexington, Concord, and Bunker hill. Eight days before the arrival of Jefferson, Washington had been appointed by congress commander-in-chief of the armies of the colonies. America was thus in open resistance against the crown. Such was the moment when Jefferson took his seat in congress. His arrival was anxiously expected, as he was known to be the bearer of the reply of Virginia to Lord North's proposal. The attitude assumed by the great province of the South was a subject of intense interest; and when the reply was delivered to congress, it met with the warmest approbation. As the author of the paper, and of the "Summary View" in the preceding year, Jefferson took his position among the leaders of the body. He had "the reputation of a masterly pen," says John Adams, and "writings of his were handed about, remarkable for the peculiar felicity of expression." He was silent upon the floor, but in committee was so "prompt, frank, explicit, and decisive," says the same authority, that he won the cordial regard as well as respect of his associates. He was at once placed upon the committee to draw up the declaration of the cause of taking up arms, and aided John Dickinson in drafting the paper, of which congress approved. The body then proceeded to act upon Lord North's proposition; and Jefferson, as author of the answer of Virginia, was requested by the committee, of which he was a member, to prepare it. He did so, nearly in the words of the former paper. Congress adopted it, and then adjourned; and Jefferson returned to Virginia with a reputation extended and increased. In the autumn he again repaired to congress, and in November the news arrived of the rejection of the last petition. This should have been the turning point of the struggle, for it really closed the door

upon all hope of avoiding formal hostilities and an open war. It had indeed appeared illogical and absurd to be in arms against the mother country and yet look forward to a renewal of the old connection. But the people generally, and even the most resolute leaders, were loth to burst asunder the familiar tie. No election was now left; and yet congress and the legislatures of 5 colonies hesitated. Not to decide at once, and definitively, upon independence, would encourage the enemy and all who wavered, discouraging equally the hearts of the patriots, but the decision was none the less serious. Finally the country spoke—North Carolina in April, Virginia and Rhode Island in May. On May 15, Virginia instructed her delegates to propose a declaration of the independence of the colonies; and congress now solemnly approached that great event. Early in June a committee to draw up the declaration was appointed, with Jefferson for its chairman. He was "unanimously pressed to undertake the draft" by his associates of the committee, and did so, Franklin and Adams only making two or three verbal alterations in it. It was laid before congress on June 28. On July 2 the resolution to declare the colonies independent, which had been introduced by Richard Henry Lee, in accordance with the Virginia instructions, passed the body, and the draft of the declaration was taken up. The debate upon the paper, as to its tone, its statements, and the propriety of adopting at that time a measure so extreme, lasted for nearly three days, and was very hot. It was so powerfully opposed by some of the members, that Jefferson compared the opposition to "the ceaseless action of gravity, weighing upon us by night and by day." Its supporters, however, were the leading minds, and urged its adoption with masterly eloquence and ability. John Adams, Jefferson declares, was "the colossus in that debate," and "fought fearlessly for every word of it." The bond which was formed between the two great men on this occasion seems never to have been completely severed. On July 4 the declaration with the amendments was agreed to; and thus commenced the republic of the United States of America. Of the declaration as a state paper or a literary composition it is not necessary particularly to speak. As the great American charter of human freedom it has sunk into and become a portion of the minds and hearts of three generations of the people. It is read with equal admiration by the learned and the unlettered; by the accomplished scholar and the ignorant artisan, if any one can be considered ignorant who has had the benefit of its teachings. As an indictment against the crown, it was concise, comprehensive, and couched in terms of dignity such as became a great people setting forth the grounds upon which they went to war. The paper has justly secured a renown more extended perhaps than that of any other state paper in existence, and will remain the monumental glory of its author. Two questions

have however arisen as to its originality: the first a general one upon the substance of the document; the second in regard to its phraseology, in connection with the alleged Mecklenburg declaration of May, 1775. It is more than probable that Jefferson made use of some of the ideas expressed in newspapers, conversation, and by public speakers at the time; and that his study of the great English writers upon constitutional freedom was of service to him. But an impartial criticism will not base upon the fact a charge of want of originality. It should rather be regarded as the peculiar merit of the writer that he thus collected and embodied the conclusions upon government of the leading thinkers of the age in Europe and America, rejecting what was false, and combining his material into a production of so much eloquence and dignity. The "Summary View" of 1774 will however be found to contain the complete germ of the "Declaration;" and as the originality of the former has not been impeached, the merit of the latter is in every fair sense due to Jefferson. The second charge, that he made use of the alleged Mecklenburg paper, has excited volumes of controversy. Jefferson distinctly denied that he had ever seen it at the time, and John Adams declared that he had not himself met with it. It is thus impossible to support the charge without fixing upon Jefferson an accusation of deliberate falsehood. The probability of this, his general character must determine. Many of the most learned investigators of our history, however, declare that no such document as the Mecklenburg declaration then existed. We shall not discuss this vexed historical question; and only add that the plagiarism, if made, embraced, as both sides admit, but two or three phrases, which still leaves to Jefferson all the rest. When congress thus authoritatively announced that America was free and independent, it is scarcely a figure of speech to say that the old world had passed away, and that the new was born. It might be strangled in the cradle, but it had at least entered upon life; and the appearance of no long hoped-for heir of royalty ever occasioned such general rejoicing. It was received by the patriots throughout the land with a feeling which partook of enthusiasm. They regarded it as the noble performance of an act which had become inevitable; and the paper itself as the complete vindication of America before the bar of public opinion throughout the world. When it was read by the magistrates and other functionaries, in the cities and towns of the whole nation, it was greeted with shouts, bonfires, and processions. It was read to the troops, drawn up under arms, and to the congregations in churches by ministers from the pulpit. The tory element of the country was completely silenced, and the inhabitants everywhere, as the signers had done, pledged to it their lives, their fortunes, and their sacred honor.—Jefferson was rechosen a delegate to congress, but resigned the appointment. "The la-

boring oar," he wrote, was at home in Virginia. His aim now was to carry out radical changes in the laws of his native state. The new era could not commence there until fundamental reforms had taken place, and the practicability of such reforms had long engaged his attention. The first movement in the proposed direction had been the formation by the convention of a constitution for the commonwealth. Just before the composition of the declaration, Jefferson had drawn up a preamble and outline sketch of the proposed instrument, and sent it to Edmund Randolph, president of the convention then sitting. George Mason had however framed a constitution upon which the final vote was about to be taken. Jefferson's draft was not proposed, but his preamble was "tacked to the work" of Mason. The great reforms in the organic laws were still unattained, however, and to these Jefferson ardently addressed himself. He was elected to represent his county, and declining the appointment by congress to become one of the commissioners to negotiate the now important treaties of commerce and alliance with France, he took his seat in the Virginia house in Oct. 1776. He commenced at once by obtaining leave to bring in bills for cutting off entails, and for a general revision of the laws of the commonwealth. A committee of revision was appointed, and Jefferson placed at the head of it, with Edmund Pendleton and other distinguished lawyers for colleagues. The work employed the committee for $2\frac{1}{2}$ years, and was arduous in the extreme. To Jefferson were allotted the common law and statutes to the 4th of James I.; and he applied himself with zeal to the revision. To the more important bills which he brought in, the opposition was resolute and bitter. The explanation of this fact may be found in a few sentences of his memoir. "I considered four of these bills," he says, "passed or reported, as forming a system by which every fibre would be eradicated of ancient or future aristocracy. . . . The repeal of the laws of entail would prevent the accumulation and perpetuation of wealth in select families. . . . The abolition of primogeniture, and equal partition of inheritances, removed the feudal and unnatural distinctions, which made one member of every family rich and all the rest poor. . . . The restoration of the rights of conscience relieved the people from taxation for the support of a religion not theirs, for the establishment was truly the religion of the rich." The latter reference is to the bill "for establishing religious freedom." On the adoption of this, and the proposition to cut off entails and abolish the right of primogeniture, took place the determined stand which has been mentioned. From the peculiar character of Virginia society at the period, no measures could have been more revolutionary. They proposed nothing less than an overthrow of the very foundations of the old social edifice. The dominant class was essentially aristocratic, and almost universally attached to the establishment. The reforms suggested by

Jefferson thus struck at their most cherished sentiments and convictions, in politics and religion. The law of primogeniture, as the cornerstone of a time-honored system derived from their English forefathers, represented their deliberate views of social order. The establishment was dear to them as the church of their ancestors for many generations, and as the bulwark of Protestant Christianity against heresy and superstition. The contest was prolonged for years, and enlisted all the ability of the commonwealth. The advocates and opponents of the measures fought with the desperation of men who were contending for the dearest prizes of existence. It was the old world struggling mortally with the new. The new conquered. The bills all finally passed, and the reorganization was complete. The property of every man became subject to the payment of his debts; the children of the same parents shared equally the patrimony; and the various denominations were placed upon a footing of perfect equality in the exercise of their religious convictions. Jefferson was justly proud of his work. When he drew up the epitaph to be inscribed upon his tomb, he added to the words, "author of the declaration of independence," those others, "and of the statute of Virginia for religious freedom." It is noticeable that the confiscation of the glebe lands was not a portion of his policy. It was reserved for the opponents of the Episcopal church to secure the passage of that law in 1802, by an unyielding and bitter enmity of more than a quarter of a century. In addition to these radical measures, Jefferson was the author of others of importance, for the establishment of courts of law, and a complete system of elementary and collegiate education. He continued to sit in the house in 1777 and 1778. In the former year he strongly opposed the alleged scheme for appointing Patrick Henry dictator—the occasion on which Cary of Amphil sent Henry word that if he was appointed he should find a "dagger in his heart before the sunset of that day." In the latter year he proposed and procured the passage of a bill forbidding the future importation of slaves.—In the spring of 1779 he was busily employed in ameliorating the condition of the British prisoners at Charlottesville, which afterward procured for him in Europe the warmest reception by these officers. On June 1 in the same year he was elected governor of Virginia. He entered upon office at a gloomy period in the history of the country. The last campaign had not been encouraging to the American arms, and the enemy were about to carry the war into the South. Virginia was to become, after the subjugation of Georgia and Carolina, the decisive battle ground, and Jefferson found the commonwealth almost defenceless. Virginia had nearly 10,000 troops in the army of the United States, and the steady drain upon her other resources had so greatly enfeebled her that there was little prospect of her being able to resist an enemy. She was however to bear

the brunt, unsupported. The southern campaign began in Georgia and Carolina, and the resources of the colonies were laid under a heavy tax for raising supplies. Virginia was so profuse in contributions of men, arms, horses, and provisions, that she was soon completely exhausted. The letters of Jefferson to Washington, and to Generals Gates and Stevens, exhibit this prostration of the resources of the commonwealth in a very strong light. The general cause had impoverished and enfeebled her to an extent which can at this day scarcely be realized. Her extended coast and the banks of her great rivers were wholly unfortified. A few small vessels and gun boats, imperfectly manned and equipped, were all that she could oppose to the approach of an enemy's fleet. The defenceless condition of the coast was soon proved by the appearance of Gen. Leslie, who easily took possession of Hampton and Portsmouth; but more than all by Arnold's ascent of James river almost unresisted with less than 2,000 men. He entered Richmond, which had recently become the capital, on Jan. 5, 1781. The public functionaries, including the governor, retired before the enemy; but Jefferson remained until they entered the lower part of the town, then a mere village, and afterward busied himself in their immediate vicinity in attempts to protect the public stores. Arnold ravaged the place, burned some buildings, and then dropped down the river again. In April Gen. Phillips ascended the river and threatened Richmond; but receiving orders from Cornwallis, who had entered Virginia from the south, he joined the main army, then advancing in pursuit of Lafayette toward the Rappahannock. Lafayette escaped, and Cornwallis determined to capture or disperse the legislature, which had adjourned to meet in Charlottesville. Tarleton was despatched upon this enterprise, and by a forced march, as usual with him, he fell upon the body almost before they knew of his approach. They were obliged to disperse, which was effected without any captures; and Tarleton detached several of his troop to take the governor prisoner at Monticello, which was in sight of the town. Jefferson received intelligence of their approach, and hastily sent off his family in the carriage to a neighbor's at some distance. Having secured his more important papers, he followed on horseback, just in time to escape the party sent to take him. Tarleton rejoined Cornwallis, burning and ravaging on his way. Among other estates laid waste was Elk Hill, belonging to Jefferson. Here a large amount of property was wantonly destroyed, the throats of horses were cut, and 30 of the slaves were carried away, 29 of whom afterward died from camp fever or exposure. Yorktown was the final result of the campaign, however, of whose details it is not here necessary to speak further. The events attending this inroad of the enemy formed subsequently the basis of violent diatribes against Jefferson, who was declared to have received warning of the danger from Gen. Washington, but to have

wantonly disregarded it, and neglected to put the state in a posture of defence. Additional charges were made, discrediting his personal courage, on the ground of his withdrawal from Richmond and Monticello before the enemy, thus leaving the community without a guiding head. The injustice of both accusations has been established. That he had the continued approbation of Gen. Washington in exhausting Virginia for the benefit of the general cause is certain; that the commonwealth, thus drained of her resources, could have been defended, is at least doubtful. The circumstances of his withdrawal from Richmond and Monticello do not support the accusation of a want of personal courage; the latter especially was deliberate, and what a good soldier would certainly have done. The real blame, if there be such, must attach to his neglect of the letter of Washington on Dec. 9, informing him that an embarkation was about to take place in New York, "supposed to be destined for the South." This communication is said, however, to have been a general circular, very similar to many others, which had never been followed by the appearance of the enemy. An error of judgment is thus all which seems to be justly chargeable upon the governor. His term of office had expired two days before Tarleton entered Charlottesville, and in his memoir he says that he had determined to decline a reelection, "from a belief that under the pressure of the invasion, under which we were then laboring, the public would have more confidence in a military chief." At the next session of the house a young member demanded an inquiry into his conduct; but it never was made, though Jefferson, who had gone to the assembly to meet it, rose in his place and demanded it. On the contrary, the house resolved "that the sincere thanks of the general assembly be given to our former governor, Thomas Jefferson, for his impartial, upright, and attentive administration while in office. The assembly wish in the strongest manner to declare the high opinion they entertain of Mr. Jefferson's ability, rectitude, and integrity as chief magistrate of this commonwealth, and mean by thus publicly avowing their opinion to obviate and to remove all unmerited censure." The charges against his administration wounded him deeply, and he did not appear in the spring session of 1782. In a letter to Mr. Monroe he describes the shock which he felt upon hearing of the motion for an inquiry in the assembly. "I had been suspected," he says, "in the eyes of the world, without the least hint then or afterward being made public, which might restrain them from supposing that I stood arraigned for treason of the heart, and not merely weakness of the mind; and I felt that these injuries, for such they have been since acknowledged, had inflicted a wound on my spirit which will only be cured by the all-healing grave."—From his retirement at Monticello, which had been recently rendered doubly gloomy by the death of Mrs. Jefferson, he was summoned by congress to act as one of

the plenipotentiaries to England, to negotiate the terms of the treaty of peace. The business was so far advanced before he was ready to sail that congress recalled the appointment; but taking his seat in that body in the winter session of 1783, he reported, as chairman of the committee to which it had been referred, the definitive treaty of peace with England. Providence thus decreed that the same person who had drawn up the declaration of independence should officially announce, as it were, the triumph of the struggle which it had inaugurated, and the freedom of his country. At the succeeding session of congress Jefferson proposed and secured the adoption of the present system of United States coinage—doing away for ever with the old *£. s. d.*, and substituting the dollar and its subdivisions, down to the hundredth part, to which, in order to describe its value, he gave the present name of cent. At the same session he drafted the report of the committee appointed to "prepare a plan for the temporary government of the western territory." Virginia held this great extent of country under charter from James I., and though the limits of the grant were afterward largely contracted, what remained was an imperial domain; and this she possessed on July 4, 1776, when like her sister colonies she became a free, sovereign, and independent state. In 1780 she ceded to the confederation the whole territory N. W. of the Ohio, but the cession was not then formally consummated. Jefferson's plan of a government for this territory was adopted with a few amendments. These consisted of an omission of the names suggested for the districts, and of the clause providing "that after the year 1800 of the Christian era, there shall be neither slavery nor involuntary servitude in any of the said states, otherwise than in punishment of crimes, whereof the party shall be duly convicted to have been personally guilty." The cession was finally consummated in 1788, and thus passed from the possession of Virginia a territory of vast extent, and incalculable fertility and value, where teeming millions are now founding great cities, and erecting new commonwealths under the banner of the federal union.—In May, 1784, Jefferson was appointed minister plenipotentiary to Europe to assist John Adams and Dr. Franklin in negotiating treaties of commerce. In July he sailed with his eldest daughter, and arrived safely in Paris, where he was joined by his associates. They addressed themselves with zeal to their ministerial duties, and succeeded in negotiating treaties with Prussia and Morocco, the ships of which latter government had made depredations on American commerce. By the treaties blockades were abolished, the flag covered the cargo, and contrabands were exempted from confiscation. With England all negotiations failed. That power was still sore from the result of the war in America. At this time Jefferson printed and distributed among his friends a small edition of his "Notes on Virginia." The substance of this work had been

prepared in 1782, at the request of a friend, M. de Marbois, French secretary of legation, in hours of confinement produced by a fall from horseback. An incorrect copy had crept into print, and the author now published it in an accurate form. The volume attracted general attention among the savants of Europe, and gained a high reputation for the writer. In the same year he furnished, at the request of the Virginia directors, a plan for the capitol at Richmond, on the model of the *maison quarrée* at Nîmes, and another for a penitentiary, similar to a building which he had examined in England. Both plans were adopted with some alterations, and the edifices are now standing. In 1785 congress appointed Jefferson minister plenipotentiary to France, in place of Dr. Franklin, who had resigned. He addressed himself with assiduity to his work, and combated the intrigues of Vergennes and Calonne, the French ministers, in opposition to the desired treaties of commerce, with energy and effect. Among other objects which he attained were the abolition of a number of monopolies, and the admission into France of tobacco, rice, whale oil, salted fish, and flour—the last two articles into the French West India islands also. In the midst of these duties he found time to make excursions into Germany, Italy, and the French provinces, whose social character he made the subject of profound study. In the saloons of Paris his conversational powers and his career in America procured him a flattering reception; and with Condorcet, D'Alembert, Destutt de Tracy, and other liberal thinkers of the age, he soon became on terms of familiar friendship. This seems to have been one of the happiest periods of his life; and his sympathies toward France remained ever afterward unshaken. He left the country before the excesses of the revolution, and always regarded it with a strong feeling of preference, especially in comparison with England. Of his diplomatic functions, a competent foreign authority has declared that they were performed with marked ability. Every event was regarded with reference to the use it might be put to for advancing American interests, and "the skill and knowledge with which he argued the different questions of national interest that arose during his residence, will not suffer even in comparison with Franklin's diplomatic talents." The adoption of the American constitution did not meet his full approval. He did not know, he wrote, whether the good or the bad predominated in the instrument, and some portions "staggered" him. He afterward formed a more favorable opinion of it.—In 1789 he obtained leave of absence for a time, and returned to America. Soon after his arrival he was offered the post of secretary of state in Washington's cabinet, and, in spite of his desire to return to France, accepted it, thus terminating unexpectedly his ministerial career. With the entrance of Jefferson into the cabinet in March, 1790, commenced the struggle between the federalists and republicans, under

the banners of their two most distinguished leaders. Alexander Hamilton, secretary of the treasury, who stood at the head of the former, was at this time 33 years of age. He was a man of elevated aims, conspicuous genius as a statesman, and unyielding courage—qualities which had secured for him the warm confidence and regard of Washington. He was in favor of curtailing state sovereignty, and investing the federal authority with as great an amount of power and prestige as was consistent with the character of a republic. He was persistently charged with a design to subvert the republic, and erect a limited monarchy upon its ruins, closely resembling that of England; but his wishes seem to have been confined to rendering the office of the executive more permanent, and enlarging his constitutional functions. Such was the system of Hamilton. Jefferson ardently opposed it. He was a democrat by nature and training; strongly opposed to England and the English system, against which he had struggled from the moment of his entrance into public affairs; and an unyielding advocate of state sovereignty and decentralization. He had written from France: "To make us one nation as to foreign concerns, and keep us distinct in domestic ones, gives the outline of the proper division of powers between the general and particular governments." His visit to Europe had strengthened these convictions of the danger of strong governments, and the uprising of the French people had secured his cordial sympathy. His reception also by the two great rivals probably had its influence. In England he was met for the most part with an indifference and scant courtesy which amounted almost to insult; in France all classes had combined to overwhelm him with attentions. In the cabinet of Washington he now represented, in their fullest strength and extent, the principles of the great republican party of the country, who opposed a strong government as tending to monarchy, advocated state sovereignty as the only true republicanism, and espoused the cause of France in opposition to England with the ardor of men who wish their brethren of other lands to triumph over oppression, as they have triumphed themselves. The two parties were thus represented by their extreme leaders, and as the members of the cabinet did not then act separately as at present, the opposing policies came into direct collision. The schism was soon complete, nor could the ponderous, slow-moving, impartial mind of Washington heal it. In all the great measures, Hamilton defeated his rival. The entire system of finance, including the establishment of a bank of the United States, proposed by the secretary of the treasury, was adopted, in spite of the protest of Jefferson, and of Randolph the attorney-general, against its constitutionality, and its dangerous character in view of "the present temper of the southern states." In Feb. 1791, Jefferson wrote an able report upon the cod and whale fisheries, recommending congress to protect those valuable branches of trade.

Later in the same year he conducted an important correspondence with Mr. Hammond, the British minister, in relation to alleged violations of the treaty of peace with England. Jefferson complained of non-compliance with that article of the treaty which contained stipulations against carrying away negroes or destroying property, and provided for the evacuation by Great Britain of all posts within the limits of the United States. Mr. Hammond replied that his government had suspended the execution of the article in question from the non-compliance of the United States with her engagements to secure the debts of British creditors, and arrest confiscations and prosecutions against British subjects. Jefferson acknowledged the state of facts complained of, but defended his government. In relation to exile and confiscation, congress, he declared, had only stipulated to recommend it to the different states, which recommendation had been faithfully made; and that the British infractions had preceded and occasioned the acts complained of as obstacles to the recovery of the debts, thereby justifying retaliation. The acts had however been repealed throughout the Union, from a conviction on the part of the states that they were controlled by the treaty; and the claim made for interest on their debts by the creditors would be left to the decision of the legal tribunals. The controversy here ended, Mr. Hammond not having replied to Jefferson's last communication; and the questions were not reopened for discussion until the more important differences occurred which were terminated by the treaty of 1794.—In the spring of 1792 Jefferson drew up an elaborate report upon the relations of the United States with Spain. These were complicated and delicate. The Spanish government had long contemplated with jealous apprehension the increasing power of the United States, and had sought to restrict its extent in the south-west. The points which now arose between the two governments were the determination of our boundaries, the exclusion of American citizens from the navigation of the Mississippi below our limits, interference with the Indian tribes, the restitution of fugitives from justice and of property carried off, and the terms of a commercial treaty. Jefferson clearly exhibited the absurdity of the Spanish claims to possessions in Georgia, on the pretence that they had been rescued from the British during the war, and showed that the boundary must remain unchanged. As to the navigation of the Mississippi, he demonstrated that this was a right under the old treaties, and by the law of nature and nations. The ocean was free to all men, and every river to the inhabitants of the countries through which it passed by the common consent of all political societies; and were the Mississippi, where it passes through Florida and Louisiana, the exclusive right of Spain, it would still be a natural right in those above to navigate it, though one which the convenience of Spain might modify. To shackle it nevertheless with regulations not ne-

cessary for the peace or safety of the inhabitants, would be an injury, and would entitle the United States to demand redress. Jefferson proposed, as the basis of a commercial treaty, to exchange between the two countries the rights of native citizens; to surrender fugitives charged with murder, but not with treason or other offences; and to make other crimes punishable by the tribunals of the nation where the criminal was found. As to any interference on the part of Spain with the neighboring Indians, it would under no circumstances be tolerated by the American government. "If Spain chooses to consider our self-defence against savage butchery as a cause of war to her, we must meet her also in war with regret, but without fear; and we shall be happier to the last moment to repair with her to the tribunal of peace and reason." The negotiations were indefinitely protracted, and it was not until many years afterward that they were even partially successful.—In the spring of 1793 arose the paramount question of the neutral policy and rights of the United States, in view of the declaration of war just made by France against Holland and Great Britain. Upon this question was put forth the entire strength of the two great leaders of the federal and republican parties in the cabinet. The republican party was enthusiastic in its sympathy for France in the struggle with her great enemies, and a disposition was immediately shown to fit out privateers in American ports to cruise against English vessels. This was energetically opposed by the federal leaders, who were anxious that no cause of hostilities should be given to England, and held that the true policy of America was to preserve peace and friendship with all nations, but form entangling alliances with none. The president, who had just entered upon his second term, therefore promptly issued his proclamation warning the citizens of the United States against carrying to the hostile powers any articles deemed contraband of war, or performing other acts inconsistent with the duties of a friendly nation. This was advised by Jefferson, as by his colleagues. He however advocated the propriety of receiving a minister from the French republic, which was determined upon. This was followed by the appearance of Citizen Genet as minister, to succeed the former royal functionary, who had been recalled. Genet authorized the fitting out and arming of privateers, and empowered the French consuls throughout the United States to erect courts of admiralty to try and condemn prizes brought into American ports. The president ordered that his privateers should leave the ports immediately, notwithstanding which he armed a prize and ordered her to sail as a privateer. (See GENET.) A hot and violent debate took place in the cabinet in Washington's absence. Hamilton, supported by Knox, advocated the erection of a battery to prevent the vessel from sailing, and denounced Genet as an agent sent to embroil America with England. Jefferson opposed the scheme of a battery, on the ground that the

vessel would not sail, and that the matter was too trifling to cause hostilities with France. Washington arrived, and addressed a heated note to Jefferson; but explanations were made. In spite of all, the vessel sailed. Genet then grew so clamorous and insolent that the question arose whether he should not be ordered out of the country. It was determined, however, to request his recall. Jefferson says that he was in favor of "expressing that desire with great delicacy;" but that "the others were for peremptory terms." He was finally recalled, and this agitating affair terminated. It had aroused to the utmost extent all the bitterness in the hearts of the two great rivals, and the meetings of the cabinet were stormy. Even Washington himself was stirred to the depths of his great soul. The insolence of Genet and the state of public feeling were exciting; but a still more bitter pill was the retention by Jefferson, as translating clerk in his office, of Philip Freneau, a violent opponent of the federal party, and editor of a paper which teemed with personal attacks on the president. Jefferson tells us that at one of the meetings of the cabinet Washington fell into one of his infrequent but terrible fits of passion, declaring that the "rascal Freneau" had sent him three of his papers daily, full of abuse and insults; and that he would rather be in his grave than in his present situation. The great chief was too proud, however, to even suggest the dismissal of Freneau, and, though "sore and warm," said that he "despised their attacks on him personally." Jefferson based his retention of this person on the grounds that no one should be ostracized for his political opinions, or for freedom of speech, and that his paper had "saved our constitution." It may have been sound reasoning; but the result of it is unfortunate for his memory. Between "the foremost man of all this world," and the violent partisan of a day, the people will never hesitate upon whom to bestow their sympathy.—The last act of Jefferson as secretary of state was an elaborate report on commercial intercourse with foreign nations, with the measures necessary for regulating and improving it. In this famous state paper he first enumerates the articles of export, with their value, and then states the various restrictions imposed upon them, calling attention to the best method of modifying or removing them. The preference is given to a policy of friendly arrangement with the nations as to which these restrictions exist, relieving commerce from its shackles everywhere, instead of embarrassing it. Against such nations as continued the system of regulations or prohibitions, the United States might enact counter prohibitions; but it was earnestly to be desired that friendly arrangements might be consummated with every power. This report gave rise to long and animated discussions, and the measures secured the favor of a great majority of the national legislature; but a vote was not immediately taken, and the subject was lost sight of.

—On Dec. 31, 1793, Jefferson resigned his place in the cabinet. His career in office had commenced at an exciting period, and he had laid the foundation of that strong partisan enmity which accompanied him afterward throughout life. But the country at large did full justice to his public services. Judge Marshall, a strong federalist, but an impartial historian, says: "This gentleman withdrew from political station at a moment when he stood particularly high in the esteem of his countrymen. His determined opposition to the financial schemes which had been proposed by the secretary of the treasury, and approved by the legislative and executive parts of the government; his ardent and undisguised attachment to the revolutionary party in France; the dispositions which he was declared to possess in regard to Great Britain; and the popularity of his opinions respecting the constitution of the United States, had devoted to him that immense party whose sentiments were supposed to comport with his own on most or all of these interesting subjects. To the opposite party he had of course become particularly unacceptable. But the publication of his correspondence with Mr. Genet dissipated much of the prejudice which had been excited against him. He had in that correspondence maintained with great ability the opinions embraced by the federalists on those points of difference which had arisen between the two republics. . . . The hostility of his enemies, therefore, was for a time considerably lessened, without a corresponding diminution of the attachment of his friends." Jefferson returned to Monticello, free once more from the turmoil and anxiety of public life, and bent on addressing himself to his private affairs. He was soon afterward visited by the duke de Liancourt, who wrote: "His conversation is of the most agreeable kind, and he possesses a stock of information not inferior to that of any other man. In Europe he would hold a distinguished rank among men of letters, and as such he has already appeared there. At present he is employed with activity and perseverance in the management of his farms and buildings; and he orders, directs, and pursues, in the minutest detail, every branch of business relating to them. The author of this sketch found him in the midst of harvest, from which the scorching heat of the sun does not prevent his attendance. . . . In fine, his superior mind directs the management of his domestic concerns with the same abilities, activity, and regularity, which he evinced in the conduct of public affairs, and which he is calculated to display in every situation of life." At this time he was elected president of the American philosophical society, in which he always took a deep interest.—In 1796 his whole mind was again drawn toward public affairs. In September of that year Washington declared that he would not be a candidate for reelection, and the two great parties fixed upon John Adams and Thomas Jefferson as their nominees. In Feb. 1797, the votes were opened and count-

ed in presence of both houses; and the highest number appearing in favor of Adams, with the next in favor of Jefferson, the former was declared, in accordance with law, president of the United States, and the latter vice-president. On March 4, 1797, Jefferson took the chair as president of the senate, and delivered a short address, in which he expressed his attachment to the laws, and his anxious wish to properly fulfil his duties. The greater part of the next 4 years was spent at Monticello, but Jefferson was a close observer of public events, and largely participated in affairs, through his wide correspondence. The reaction of public feeling, resulting from the excesses of the reign of terror, had almost overwhelmed the American sympathizers with France. The aggressions of the French directory, and the insulting reception of our envoys, were now destined to still further paralyze the enemies of the federalists. The "war message" of Adams in the spring of 1797 threw the country into unheard of agitation. The general indignation against France was so violent, that it swept all opposition before it. Congress declared all treaties annulled; merchant vessels were authorized to resist restraint or search; large sums were voted for defence; and these active measures were soon followed by others still more energetic. The alien and sedition laws were passed; the former empowered the president to order out of the country such aliens as he considered dangerous, on pain of heavy penalties; the latter declared that printing or uttering false and malicious charges against the president or congress, in order to defame them, or excite hatred against them, should be deemed sedition, and be punishable with fine and imprisonment. These violent and unconstitutional measures were vainly opposed by the republican party, who were completely silenced by the general turmoil. The whole nation was hot for war, and even Washington, issued from his retirement, and again buckled on his long disused sword, to take his place at the head of the army. Nothing was left for the republicans but to make an issue on the constitutionality of the alien and sedition laws, and even this was impossible in congress. "Finding themselves of no use there," they determined to resort to the state arenas; and the result was the Kentucky and Virginia "resolutions of '98." The former state was closely connected with Virginia, and Jefferson drafted the "Kentucky resolutions," denouncing the obnoxious laws, and intimating a determination on the part of the states to proceed to armed resistance. They were followed in Virginia by similar resolves, drawn up by James Madison, opposing the consolidation measures of the federal party, and calling on the states to maintain their liberties inviolate. The spring of 1799 brought a revulsion in favor of the republicans. Adams sent envoys to France; Washington, "horror-struck," retired again to Mount Vernon; and the war spirit rapidly subsided. This was the last appearance of the great chief of the

revolution in public affairs; and a few months afterward he passed away from the arena of his struggles and his glory. He did not live to look upon the new order of things, in which his opponents, after long waiting, were to triumph. The momentary pause in political strife which succeeded the intelligence of his death, was followed by more violent commotions than before. The elections in New York in the spring of 1800 were bitterly contested, but terminated in a republican triumph which extended throughout the Union. The result was largely attributable to the masterly intrigues of Aaron Burr, who became the republican candidate for vice-president, and Jefferson for president. The federalists supported Adams and Pinckney. When the votes were opened, it was found that Jefferson and Burr were elected, but by an equal number of voices. The dilemma was serious, as the constitution did not require the specification of the office to which each was elected, and the decision devolved upon the house of representatives. Many weeks of violent struggles on the part of the supporters of the two gentlemen took place; but on the 36th ballot Jefferson was elected president and Burr became vice-president.—Jefferson took his seat, March 4, 1801, at Washington, to which the capital had been removed some months before, and delivered an inaugural address which is unsurpassed among his many great state papers. It summed up in lucid and eloquent words the principles of republican government, and breathed a spirit of the most enlarged patriotism, and the warmest devotion to the public good. Jefferson had come in upon a swelling tide of popularity, and he carefully avoided all acts which would tend to diminish it. Few removals were made, and these chiefly of those who were appointed by Adams in the last hours of his administration. A general amnesty was granted to the federalists, and they seemed to gradually become merged in the masses, which every day grew more "republican." The old régime appeared to have suddenly passed away. A change in dress and manners followed the political success of the republicans. The reaction against the stately dignity and ceremony of Washington's era was headed by the new president, who would have no formal address from congress, and sent in his message by a common messenger. Everywhere the new philosophy of life was received with acclamations which swelled still higher the flood of Jefferson's popularity. The public events of his administration were such as to increase rather than diminish the ovation. In 1800 Louisiana had been ceded by Spain to France, and in 1802 the president opened a private correspondence with the French government, which resulted in the succeeding year in the purchase of the entire territory for the insignificant sum of \$15,000,000. The question of the constitutionality of that measure was evaded, and so great was the advantage which it secured, that all opposition soon disappeared. In 1804 Captains Lewis and Clark, under the auspices of Jefferson, set out

to explore the continent to the Pacific, with instructions drawn up by the president's own hand. The expedition returned two years afterward with a mass of valuable information, which exhibited the skill of their instructions. In 1803 the administration enjoyed a portion of the credit secured for Commodore Preble by his prompt vindication of American rights in the Mediterranean against the emperor of Morocco. The Tripolitans also were compelled to sue for peace; and the people of America were thrilled by the daring and glorious exploit of Stephen Decatur, who in a small schooner entered the harbor of Tripoli, and burned the Philadelphia frigate, under the guns of the enemy, returning without the loss of a man. The acquisition of Louisiana, the naval victories, and the general prosperity throughout the nation, greatly increased the popularity of the administration; and Jefferson was reelected, with George Clinton of New York for vice-president, for the term commencing March 4, 1805, by a majority of 148 out of 176 votes. In 1806 he was called upon to arrest for treason the predecessor of Clinton in the chair of vice-president. Aaron Burr had in 1804 slain Alexander Hamilton in a duel, and, finding himself thereafter the mark of general odium, had striven to retrieve his desperate fortunes by a scheme of equal extent and audacity. This was to raise a large force in the western and south-western states, and either separate those states from the Union, forming another confederacy, of which he should be president, or carry his expedition thence against Mexico. Which of these projects he had definitely determined upon is not accurately known. He proceeded to make levies on the Ohio, and throughout the West; but the expedition was frustrated by the president's proclamation, and the arrest of its author. He was brought to Richmond, where an indictment was found against him for treason. But Judge Marshall, who presided, did not regard the evidence as sufficient for his commitment on this charge, and he was put upon his trial for a high misdemeanor, in setting on foot within the territories of the United States an expedition against the dominions of the king of Spain, a friendly power. The former position of the accused, and his prominence before the country, rendered the trial one of deep interest. It soon took a political complexion, and the opponents of the administration bitterly inveighed against the anxiety displayed by the president to procure a conviction. Such a desire was undoubtedly displayed; but Burr was discharged for want of legal evidence establishing his guilt. At the same time occurred an event which powerfully aroused the indignation of the country. For many years the American ships had profited by the general destruction of commerce attending the wars of Europe, and as neutrals had entered every port. In 1806, however, England issued her orders in council blockading the ports of France and her allies; and these were followed by Napoleon's

Berlin decree closing the harbors of England. The crowning grievance was the "right of search" asserted by Great Britain, under color of which American vessels were boarded, and her sailors impressed as subjects of the king. This cruel wrong had been persistently opposed, but the claim never relinquished. An event now occurred which brought things to an issue. In June, 1807, the American frigate *Chesapeake*, which had just set sail for the Mediterranean, was stopped by the *Leopard*, a British ship of war, and, on her commander's refusal to submit to a search, was fired upon and forced to surrender four of her crew. She had no means of resisting this demand, and returned immediately to Hampton Roads. The country was in a flame at the intelligence, and the president issued his proclamation, interdicting the entrance of British armed vessels into the ports or waters of the United States. The outrage was disavowed by the English government, and two of the men sent back to America; but the orders in council against neutrals were continued in full force, and a new decree of the French emperor followed. In consequence of this hostile policy congress in December passed an act laying an embargo upon American vessels, which were forbidden to leave any port of the United States. This law was violently opposed by the federal party, who denounced it as an unnecessary and ruinous measure. It was, however, regarded as wise and judicious by Napoleon; and the American minister in England wrote that its repeal would be "fatal to us." It was declared by the friends of the president to be intended as only temporary; and in Feb. 1809, congress repealed it from and after the 4th of the ensuing March, substituting an act of non-intercourse with France and England.—At this point in the history of the country, Jefferson retired from office, and terminated his political career. He had taken leave of congress in his last message, which thanked them and the citizens at large for their long confidence; asserted the purity of his motives in the administration of public affairs; and declared his conviction that Heaven had in store "for our beloved country long ages to come of prosperity and happiness." Two days before the expiration of his term he wrote to his friend the duke de Nemours: "Within a few days, I retire to my family, my books, and farms; and having gained the harbor myself, I shall look on my friends still buffeting the storm with anxiety indeed, but not with envy. Never did a prisoner released from his chains feel such relief as I shall in shaking off the shackles of power." Addresses were passed in numerous places, bearing high testimony to the character of his public services. That from the general assembly of Virginia was warm and eloquent, and must have stirred his pulses. He was present at the inauguration of Madison, his successor, and then returned to Monticello in his native county, whose inhabitants received him with a congratulatory address. He remained in retirement ever afterward, em-

playing his time in the performance of his various duties as the head of a large establishment. In 1817 he took an active part in the measures then set on foot to establish the "central college" near Charlottesville, now the university of Virginia. In 1819 he superintended the erection of the building, and in the same year was chosen rector. The leading part which he took in founding this great institution was a subject of peculiar pride with him, and he directed "Father of the university of Virginia" to be inscribed upon his tombstone. In the spring of 1826, his fortunes having become greatly embarrassed by the generous scale of his expenditures and the profuse hospitality at Monticello, he was empowered by the legislature to dispose of his estates by lottery, with a view to the discharge of his liabilities. But the project was suspended, and then abandoned. His health had long been failing, and in June he rapidly declined. As midnight approached on July 3, he was evidently dying, but retained his memory, and muttered: "This is the 4th of July." He lived until past noon on the succeeding day, July 4, 1826, when he expired—a few hours before John Adams, whose dying words were: "Thomas Jefferson still survives!" On the same day and nearly at the same hour, just half a century before, these two great men had attached their signatures to the declaration of independence; and the singular fact made a deep impression on the country.—The character of Thomas Jefferson, as a man and statesman, is easily deduced from the events attending his career. He was an original thinker in every department of human concern, and essentially a reformer. In this will be found the explanation of his life. He had no respect for claims of right founded only upon prescription, and attached no decisive weight to authority. In the old house of burgesses he opposed parliament upon abstract grounds which were clearly defined, and which became the bases of the subsequent struggle, inaugurated by the formal exposition of the same principles in the declaration of independence. In the general assembly, under the commonwealth, he attacked the time-honored system of aristocratic and religious intolerance, as in open conflict with natural right, and for that reason wrongful, however fully acquiesced in and respected by preceding generations. This want of reverence for king, parliament, nobility, and aristocracy, accompanied him to the cabinet, and dictated his opposition to England. He carried the rule of subjecting every thing to the test of abstract reason into matters of religion. Discarding faith as unphilosophical, he became an infidel—thus presenting the remarkable spectacle of a man of powerful mind and amiable disposition, deeply venerating the moral character of the Saviour of the world, but refusing belief in his divine mission. In politics, Jefferson, from native bent of intellect, was an opponent of strong government, and always maintained that the world was governed too much. He was in favor of the free

development and exercise of human power, so far as was consistent with the good order of society, and a jealous advocate of individualism. This fact colored and shaped his whole political theory. The strength of his convictions is obvious in the nature of the changes which he made in Virginia law. His aim was to overthrow the old domination of the ruling classes, and raise the people. He carried the same principles to the study of the federal compact. Once convinced that the state rights doctrine of restriction was the true theory of the government, he fought for it with persistent energy. Thus commenced, on the threshold of his entrance into the cabinet, the long struggle against Hamilton, the federal champion. The first measure of that great leader, the funding law, had passed; and it was followed by the assumption of state debts, and by the U. S. bank, in spite of Jefferson's protest against the constitutionality of the measure. He did not waver, however, and he was rewarded. The republican party, long suffering a series of defeats, never found its leader wanting, and grew finally into that great flood in 1801, which bore Jefferson triumphantly into the presidency. In this passionate struggle he was often blinded and carried away by the mere force of his own convictions. His devotion to state rights was so ardent that it led him to regard Shays's insurrection as a mere trifle, which the government made itself ridiculous by opposing. In the same manner he had written: "The late rebellion in Massachusetts has given more alarm than I think it should have done. Calculate that one rebellion in 13 states, in the course of 11 years, is but one for each state in a century and a half. No country should be so long without one." He could never get rid of the idea that Hamilton wished to create a monarchy in America. The party which supported the federal construction was "aristocratic and monarchial," desirous to "draw over us the substance, as they have already drawn the forms, of the British government." Such was Jefferson as a statesman and leader of a party under the old régime, which was ruled by his enemies. Under the new order of things, with his own party in power, the case was altered. The force of his opinions of the rights of individuals suffered a marked diminution when Aaron Burr openly bearded his authority. He threw the weight of his great office against Burr, and advised that one of his counsel, Luther Martin, should be indicted as an accomplice, in order to "put down this impudent and unprincipled federal bulldog." In the same manner, his state rights doctrines became modified. Once holding the reins of supreme authority, he found the difficulty attending an administration of the government upon the abstract theories which he had so long advocated. The executive authority had to be stretched until it cracked, to cover the purchase of Louisiana; and he became convinced on other occasions that the federal government, to use his own expression, must "show its teeth." This change of

ground might be further established by innumerable events of the president's career; but this is unnecessary. It would only prove what has never been doubted, that Jefferson was a strong partisan, as well as a conscientious administrator of public affairs.—A few additional points of his character still remain to be noticed. In social life he faithfully carried out his democratic principles. Born in a class which then enjoyed a prestige and authority resembling that of the higher castes of India, he discarded every advantage which his birthright gave him, and mingled familiarly with the common people, as their equal and no more. His enemies charged him, in this, with courting popular favor and applause; but the accusation is not wholly sustained. He was naturally a democrat, and held as a radical doctrine of his philosophy the principle that one man is no better than another. He was thus easily approached, and the natural *bonhomie* and amiability of his character rendered his society delightful to all classes, however humble. This trait made him distasteful to John Randolph and other lovers of the old aristocratic system, and they declared that his "levelling doctrines" would result in the marriage of the daughters of gentlemen to "overseers," then the coarsest class. But the people at large hailed his principles as the true rule of life, and the triumph of just reasoning. His dislike of all the trappings of authority was excessive. Whatever even recalled the old system of prescription and prestige assumed a portentous and disproportioned importance in his eyes. Not content with eradicating all traces of past authority and influence, he inaugurated a crusade against the old forms and ceremonies which had accompanied it. Washington had held levees, and awaited the two houses, standing calm and stately, in full dress, to receive them. Jefferson abolished the practice, and sent his first message by an unofficial hand to avoid the address which was customary. A committee had been usually appointed to inform the president of his election; but Jefferson declared it was more in consonance with the simplicity of republican institutions to communicate the intelligence through the common post office. To all titles of honor he was strongly opposed. "Excellency," "Honorable," and even "Mr.," were distasteful to him. He could wish, he declared, that the last, too, might disappear. It was always "Thomas Jefferson," or "T. J.," not "Mr. Jefferson," who presented his respects to "the president," not "your excellency." These apparent trifles were in reality strong indications of the character of the man, and contributed powerfully to his popularity with the people. He was regarded as the epitome and incarnation of democracy, as opposed to the old world of aristocracy. In the plain good-humored man, whom all might approach, clad in every-day garments, and scarcely distinguishable from an honest yeoman, the masses discovered a delightful contrast to the powdered and stately "nabobs" of the past. Such were the social traits which endeared Jef-

erson to the people. They were supported by consummate partisan ability. He never made a formal public speech, but his adroitness in politics was unsurpassed and his management of persons and events for the accomplishment of the ends which he aimed at was masterly. The objects which he had in view were in a large measure attained by his elaborate correspondence. Few human beings have written more letters during their lives. Monticello became the centre as it were of a vast system of political nerves, extending their ramifications throughout the nation. In his retirement Jefferson was thus as powerful as in office. His hand was often felt as decisively, and his opinions, instilled into active minds holding high positions, became not seldom the ruling influences in public affairs. The great system of opinions which he early embraced, and mainly afterward clung to, has been sufficiently noticed. On the question of slavery, which arose two or three times during his career, his views are well known. He regarded the institution as a moral and political evil: as a moral evil, because it was repugnant to his cherished convictions of the equal rights of man; and as a political evil, from the assistance it afforded to the old feudal system of aristocracy, which he opposed, and would have struck almost mortally in abolishing the institution. In thus opposing it he did not advocate a change in the agricultural character of the South. He wrote that the people would "remain virtuous as long as agriculture is our principal object, which will be the case while there remain vacant lands in America. When we get piled upon one another in large cities, as in Europe, we shall become corrupt as in Europe, and go to eating one another as they do there."—It only remains to speak briefly of Jefferson in his character of a country gentleman. As such he appears to very great advantage. He was a tender husband and father, a mild master, a warm friend, and a delightful host. His knowledge of life, extensive travels, and long familiarity with great events and distinguished men, rendered his conversation highly attractive to mere social visitors. His scientific acquisitions, and the deep interest which he took in all branches of natural history, made his society equally agreeable to men of learning. Many such visited him, and were impressed as deeply by his general knowledge, as they were charmed by the courtesy of his demeanor. De Chastellux, De Liancourt, and other noblemen and foreigners of distinction, came away from Monticello with an enthusiastic opinion of their host, and informed all Europe that the country gentleman of Virginia was the most accomplished man of his epoch. In entertaining this diverse society, in reading, writing, riding, and attending to his farms, passed the intervals of his absence from public affairs, and the long period of retirement which extended from the termination of his presidency to his death. His career had been agitated, but splendid, and in the main happy. He had bitter enemies, but doubtless persuaded

himself that such was the inevitable result of the great part which he had played during a period of violent party conflict. He had thousands of devoted and admiring friends, and these consoled him for the enmity of others. In the enjoyment of the immense fame attaching to his name as the writer of the declaration of independence, and regarded by the people as the founder of the conquering theory of democracy, he thus passed the long years of his retirement, and finally expired, with a sort of poetic justice, on the 50th anniversary of the act which constituted his chief glory, near the spot where he had drawn his first breath, and surrounded by a family and friends equally loving and admiring him.—The latest and most complete biography of Jefferson is by Henry S. Randall, LL.D. (3 vols. 8vo., New York, 1858). His "Memoirs, Correspondence, and Private Papers" were published by his grandson, Thomas Jefferson Randolph (4 vols. 8vo., Charlottesville, Va., 1829; reprinted in London, Boston, and New York). Biographies of him have also been written by George Tucker (2 vols. 8vo., Philadelphia, 1837), B. L. Rayner (12mo., Boston, 1834), and W. Linn (12mo., Ithaca, 1834). His manuscripts were purchased by congress in 1848, and published under the title, "The Writings of Thomas Jefferson; being his Autobiography, Correspondence, Reports, Messages, Addresses, and other Writings, Official and Private," &c. (9 vols. 8vo., Washington, 1853-'5), edited by H. A. Washington. Many editions of his "Notes on Virginia" have been printed, the last at Richmond, Va., in 1853, from the author's annotated copy. His "Manual of Parliamentary Practice" is still in use by congress and American legislative bodies generally.

JEFFERSON CITY, the capital of Missouri and seat of justice of Cole co., situated on the S. or right bank of the Missouri river, 143 m. above its confluence with the Mississippi, and opposite the mouth of Cedar creek, and 125 m. W. from St. Louis, with which it is connected by the Pacific railroad; pop. in 1850, about 1,600; in 1856, 1,924; in 1859, 3,500. It is built on elevated and uneven ground, commanding a fine view of the beautiful scenery on the N. bank of the river. The principal public edifices are the state house, a handsome building of stone, the governor's residence, the state penitentiary, several hotels, and churches of various denominations. The city has a bank, beside a branch of the bank of the state of Missouri, 2 weekly newspapers, flour mills, and manufactories of wooden and iron ware, carriages, furniture, &c. A great impetus has been given to its trade by the construction of the Pacific railroad, which will extend when finished from St. Louis to Kansas City. It is now (Jan. 1860) in running order from the former place to a point 43 m. W. from Jefferson City.

JEFFERSONIA (Barton), a vernal plant of the natural order *berberidacea*, occurring in rich woods from western New York to Wisconsin and southward, named in honor of Thomas Jef-

ferson. The leaves, which are only two and bipartite, rise immediately from a horizontal rootstock borne upon long petioles, and unfolding a handsome white flower an inch in diameter, not unlike that of the blood root, and appearing in April and May. The calycine leaves are either 3 or 5, the petals often amounting to 9 in number. Some variations in the forms of the leaves have been deemed of sufficient importance to establish two distinct varieties; in one the leaflets are nearly entire, or at least only obscurely sinuate; in the other, the leaflets are incisely from 5 to 7 lobed. The common name of the plant is twin-leaf, and in some places rheumatism root. The root is said to be stimulant, diaphoretic, and antispasmodic. It is sometimes employed as a remedy in chronic rheumatism.

JEFFERSONVILLE, a city of Clark co., Ind., situated at the head of the falls on the Ohio river, nearly opposite Louisville, Ky., and 40 m. below Madison; pop. in 1859, 3,500. It is built on high ground on the site of old Fort Steuben, and commands a magnificent view of the river and of Louisville. The streets are wide, well paved, and laid out at right angles with one another. The Jeffersonville and Indianapolis railroad has its S. terminus here. The Ohio is 1 m. wide in this part of its course, and in a distance of 2 m. has a fall of 22 feet, which affords unrivalled motive power. Little use has been made of this advantage, however, until within the last 3 or 4 years. The depth of water is sufficient at all seasons for craft of large size, and steamboat building is an important branch of industry. The city has 2 manufactories of agricultural implements, 1 of carriages, 1 of steam engines, 2 steam saw mills, a large flouring mill, an iron foundry and machine shop, a brass foundry, 2 weekly newspapers, and a working men's library. It is the seat of the state prison, with an average number of 275 prisoners. During the year 1857 the excess of the receipts of this institution over its expenditures was \$4,319.88.

JEFFREY, FRANCIS, a Scottish judge, critic, and essayist, born in Edinburgh, Oct. 23, 1773, died in Craigerook, Jan. 26, 1850. The eldest son of a deputy clerk in the court of session, he was educated at the high school of Edinburgh (1781-'7), the university of Glasgow (1787-'9), and Queen's college, Oxford (1791-'2). He was remembered by his associates at the high school as a little, clever, anxious, dark, and vigorous boy, always near the top of the class, and never losing a place without shedding tears. At Glasgow he distinguished himself as one of the most acute and fluent speakers in the debating society, and formed the habit of systematically accompanying all his studies by collateral composition. There remain 31 manuscript essays on literary and philosophical subjects which he wrote in the interval that he passed in Edinburgh before going to Oxford. He took little pleasure in his brief residence at Oxford, declaring in his letters that there is nothing "so melancholy as a company of young men without

any feeling, vivacity, or passion," and that, "except praying and drinking, he saw nothing else possible to acquire in this place." He passed one session there, solitary and dispirited, and then returned to his friends at Edinburgh, and began to prepare for the Scotch bar. He attended the law classes at the university, was at the same time busy with literature and poetry, and was admitted, Dec. 11, 1792, into the speculative society, the distinguished names connected with which have made it historical, and in which for nearly 10 years he trained his powers of speaking and writing, having among his competitors Walter Scott, Lord Henry Petty (marquis of Lansdowne), Henry Brougham, Francis Horner, John A. Murray, James Moncrieff, and Henry Cockburn. It was affirmed that neither he, Horner, nor Brougham ever spoke better than in the Tuesday evening debates of this society. He was admitted to practice at the bar, Dec. 16, 1794, but suffered under the disadvantages of being as devoted to literature as to law, and of having proclaimed himself a whig in politics, while the effect of the revolutionary excesses of France not only debarred Scottish whigs from hope of preferment, but almost placed them under a social ban. The party included but few eminent and powerful men, but its strength was gradually increased by the accession of young lawyers of remarkable ability, who amid the prevalent discussion of principles boldly staked their fortunes on the liberal side. Of these Jeffrey was one of the leaders in the speculative society, but made so little progress at the bar that in 1801 his professional income had amounted in no one year to £100. In that year he married, with "all the recommendations of poverty," and took up his residence in a third story in Buccleugh place. There several of his young whig associates, prominent among whom were Sydney Smith, Brougham, and Horner, were wont to visit him, and it was at these social meetings that the "Edinburgh Review," which first opened a career to him, was suggested and planned. From the beginning he seems to have been their principal reliance, since he had not only engaged more largely than the others in critical studies, but had already had several papers published in existing periodicals; and after the first 3 numbers of the review he became its official editor. The first number appeared Oct. 10, 1802, containing beside others 7 articles by Sydney Smith, 4 by Horner, 4 by Brougham, and 5 by Jeffrey. The learning, talent, spirit, and eloquence which marked it caused it to be hailed at once by the liberal party as the dawn of a brighter day, and by thoughtful men, indifferent to party, as an organ of the highest order for the able and fearless discussion of every matter worthy of inquiry. One portion of the public charged it with scandalous severity; others expressed their pleasure at seeing the laws of the republic of letters enforced with unaccustomed rigor. A first and a second impression of 750 copies were rapidly exhaust-

ed; at the issue of the 3d number the regular sale was 2,500 copies, and in 1813 it exceeded 12,000. Jeffrey continued to edit it for 26 years, during which period he was its most popular and effective contributor; and he wrote for it at long intervals till near the time of his death. The whole number of his contributions is 200, of which 79 were selected for republication (4 vols., London, 1843; 3d ed., 1 vol., 1853). In the larger part of them he appears as literary critic, but several are devoted to metaphysics and to politics. It was his aim, as he said, "to impress his readers with a sense of the close connection between sound intellectual attainments and the higher elements of duty and enjoyment, and of the just and ultimate subordination of the latter to the former;" and the thoroughness and ability with which he analyzed literary productions, pointed out their beauties, and chastised their defects, was unprecedented in periodicals. Flushed with success, it was quite as much his object to be startling as to be just, and his judgments on many contemporary poets have been reversed by time. His attack on the "Odes and Epistles" of Moore (1806) led to a duel with that poet, which was interrupted by the police, and the parties afterward confessed that they took a fancy to each other from the first moment of their meeting on the field. Against Wordsworth, Southey, and Coleridge he waged a long war, with a severity which he subsequently admitted to be unjustifiable, acknowledging in a note to his collected essays that the poets had triumphed over the critic. He was perpetually attacked in turn in "Blackwood's Magazine," with the principal writers for which he was on friendly terms. Southey pronounced him "a bad politician, a worse moralist, and a critic, in matters of taste, equally incompetent and unjust;" and Wordsworth classed him with Robespierre and Bonaparte as the three most formidable enemies of mankind that had appeared in his remembrance. Yet even in his harshest critiques it was his custom to select the finest passages for quotation. A review of Alison's "Essays on Taste" (1811) was the basis of the article on beauty which he furnished in 1824 to the "Encyclopædia Britannica." In 1813, after being a widower 8 years, he visited New York to marry Miss Charlotte Wilkes of that city, a grandniece of the celebrated politician John Wilkes. In 1815 he took up his residence at Craigerook, two miles from Edinburgh, where he passed his summers until the year of his death. There he hospitably entertained his numerous political and professional friends, and Lord Cockburn affirms that "no unofficial house in Scotland has had a greater influence on literary and political opinion." His expressive and variable features, which made it almost impossible for an artist to paint his portrait, his courtesy and love of children, and his shrill voice, impressive even when scarcely raised above a whisper, were among its attractions. His reputation at the bar increased with his success as a reviewer. He

rose to the highest eminence as a pleader, was elected in 1821 lord rector of the university of Glasgow, and in 1829 dean of the faculty of advocates, was appointed lord advocate in 1830, entered the house of commons in 1831, and was elevated to the Scottish bench in 1834. He took part in the reform debates in parliament, but did not maintain in that arena the reputation for eloquence which he enjoyed at the bar. As a judge he was a model of courtesy and patience, and remarkable for the rapidity of his decisions and the vivacity and clearness of his statements. He was most highly esteemed in private life, and as a brilliant converser, abounding in wit, fancy, and amiability. All his writings display a rapid, versatile, and delicate rather than profound intellect. "With little imagination," says Talfourd, "little genuine wit, and no clear view of any great and central principles of criticism, he has contrived to dazzle, to astonish, and occasionally to delight multitudes of readers, and, at one period, to hold the temporary fate of authors at his will. Without deep feeling, which few can understand, he has a quick sensibility, with which all sympathize; without a command of images, he has a glittering radiance of words which the most superficial may admire; neither too hard-hearted always to refuse his admiration, nor too kindly to suppress a sneer, he has been enabled to appear most witty, most wise, and most eloquent to those who have chosen him for their oracle." His biography was written by Lord Cockburn, with a selection from his correspondence (Edinburgh, 1852; reprinted in Philadelphia).

JEFFREYS, GEORGE, lord, an English judge, born in Acton, Denbighshire (Wales), in 1648, died in the tower of London, April 19, 1689. His family was good, though not rich. He was educated at Shrewsbury, at St. Paul's school, London, and at Westminster school, under Dr. Busby; and he early gave indication of high talents. His father was unable to send him to the university, and he became a member of the Inner Temple, May 19, 1663. Of his boyhood and youth but little is known, and that is not to his credit. He was called to the bar Nov. 22, 1668, having, 18 months before, married Mary Nesham, daughter of a clergyman, under circumstances of a romantic character. On the death of this lady, in 1678, he married Anne, widow of Sir John Jones, who had been lord mayor of London. His rise at the bar was rapid, but his practice was in the Old Bailey and other London courts, always beneath the other tribunals in conduct, and in that age scarcely better than dens of torture and murder. In such a school the natural ferocity of his temperament was rapidly developed, and he soon exhibited that brutality which has won him infamy throughout the civilized world. So quickly did he rise, that in March, 1671, he became common sergeant of the city of London. At that time he belonged to the "country party," and laid the foundations of his fortune by affecting to be a patriot and a Puritan; but he intrigued se-

cretly for court favor, and was made solicitor to the duke of York, Sept. 14, 1677, and knighted. This startled his associates, but he insisted that the office was strictly professional in its character, and in 1678 men of both parties united to elect him recorder of London. He then went boldly over to the court party, and for the rest of his life so acted as to deserve the title of the worst tool ever used for the destruction of freedom by the house of Stuart. In the days of the popish plot he was one of the most active against the accused parties, acting both as judge and as counsel, in different courts; and it was by his advice that the government placed itself at the head of the patrons of the plot, whereby its inventors were prevented from turning it to the profit they had expected. He was appointed chief justice of Chester, and made king's sergeant, in April, 1680, and created a baronet. He offended the house of commons, and was reprimanded on his knees. The office of recorder he gave up Dec. 2, 1680. When the Oxford parliament was dissolved, in 1681, and Charles II. resolved to destroy the whigs, Jeffreys became the most efficient agent of government. He labored against the city of London, which had been his first patron, and helped to extinguish its liberties. He was of counsel for the crown on the trial of Lord Russell, and bore himself so villainously that he was made chief justice of England, in order that he might effect the destruction of Algernon Sidney. He was deeply concerned in several other murders of the same kind, and in the assaults on the municipal corporations. He presided at the trial of Oates, and at that of Baxter. On May 15, 1685, James II. made him a peer, by the title of Baron Jeffreys of Wem. He was the second chief justice ennobled in England, Hubert de Burgh being the first. In the summer of that year he was placed at the head of a special commission to try persons accused of having taken part in Monmouth's rebellion, in the counties composing the western circuit. Of the prisoners brought before him, 320 were hanged, and 841 ordered to be transported and sold into the slavery of the tropics. Others were most barbarously punished with scourgings, imprisonment, &c. Jeffreys boasted that he had hanged more traitors than all his predecessors since the conquest. His cruelty was all the more offensive because he traded in pardons, and in that way rich offenders escaped. That his aim was to please James II. admits of no doubt, though in after days the king declared that Jeffreys exceeded his instructions, while the judge asserted that he gave offence by being too merciful. The king called his judge's doings "the chief justice's campaign in the west." He rewarded Jeffreys by making him lord high chancellor of England, Sept. 28, 1685, which office he held until the downfall of the Stuarts, three years later. In the house of peers he made a bad figure. Attempting to bully the peers, he was firmly met, and so humiliated that he wept. The court of high commission having

been revived, Jeffreys was appointed its president, and took part in its worst acts. It was by his advice that the 7 bishops were imprisoned and tried. In 1688 the university of Oxford refused to elect him their chancellor. There was not one of the deeds of folly and crime that caused the overthrow of James II. to which Jeffreys was not a party; and when the king was frightened into a change of policy, Jeffreys became his agent for good purposes. He carried back its charter to the city of London, and was hooted by the people. When the king fled from London, he took the great seal from Jeffreys, and threw it into the Thames. The ex-chancellor disguised himself, and made arrangements to sail for Hamburg. He might have escaped, had he not returned to land for the indulgence of drunkenness, which led to his being recognized and seized. The mob wished to tear him in pieces, but the authorities succeeded in placing him in the tower, Dec. 12, 1688. There he remained for upward of 4 months, when he died of the stone, having much aggravated his disease by his indulgence in drinking. Even to the last he could not be made to understand that his conduct on the western circuit was bad, and, tried by the standard of his time, it was not so heinous as it appears to us. He was the worst man of a hard and ferocious age, and differed only in degree, not in kind, from many of his contemporaries. Suffering constantly from disease peculiarly trying to the mind, and an habitual drunkard, his actions were the consequence of infirmities and failings; and the chief fault was to be found in the kings who placed him in positions where it was impossible for him to act otherwise than as a beast of prey. It is asserted that James II. was so well pleased with him, that if the revolution had not occurred he was to have received promotion in the peerage, by the title of earl of Flint. Lord Campbell says that "as a civil judge he was by no means without high qualifications; and in the absence of any motive to do wrong, he was willing to do right;" and that "when quite sober he was particularly good as a *nisi prius* judge." Lord Macanlay, who has dealt with his memory with almost as much severity as Jeffreys dealt with the western whigs, says: "His enemies could not deny that he possessed some of the qualities of a great judge. His legal knowledge, indeed, was merely such as he had picked up in practice of no very high kind. But he had one of those happily constituted intellects which, across labyrinths of sophistry, and through masses of immaterial facts, go straight to the true point." His biographer, Mr. Woolrych, who has done all that can be done to place him well before men, says: "His bright sterling talents must be acknowledged; that intuitive perception which led him to penetrate in a moment the thin veil of hypocrisy, and show things as they were, must have its meed. Like Thurlow, he had the especial gift of fastening on the true genius of the cause, eliciting its nice point, and forming a prompt decision on the right bases of equity

and justice." In spite of these eulogies, few persons will dissent from the declaration of Mr. Justice Foster, that he was "the very worst judge that ever disgraced Westminster hall." Though Jeffreys was the father of 12 children, his family became extinct at an early day, and his title disappeared from the peerage in 1703.

JEFFRIES, JOHN, an American physician, born in Boston, Mass., Feb. 5, 1744, died there, Sept. 16, 1819. He was graduated at Harvard college in 1763, and subsequently studied medicine, and was admitted to practice. With a view to a more thorough professional education, he attended the medical schools of London, and in 1769 received from the university of Aberdeen the degree of M.D. Returning shortly after to Boston, he entered upon a lucrative practice, which continued until the evacuation of the town by the British troops, whom he accompanied to Halifax. After serving as surgeon-general of the troops in Halifax, he was appointed in 1779 surgeon major of the forces in America, and was present for a short time with the army in Savannah. In the succeeding year he established himself in London in the practice of his profession, and with so much success that he declined the offer of the lucrative post of surgeon-general to the forces in India. He also occupied himself much with scientific studies, and in the prosecution of his experiments in atmospheric temperature undertook, Jan. 7, 1785, a remarkable voyage in a balloon from Dover cliffs across the British channel, landing in the forest of Guinnes in France. This was the first successful attempt at aërostation on an extended scale, and Dr. Jeffries in consequence received many attentions from the learned and scientific societies of Paris and from various eminent personages. He subsequently read an account of his experiments before the royal society of London. In 1789 he returned to Boston, where he practised his profession until the close of his life. He had a taste for anatomy, and announced a course of lectures in Boston on the subject. Such, however, was the prejudice against the practice of dissecting, that on the evening of the second lecture a mob broke into his anatomical room, and bore away the subject, the body of an executed felon presented to him by the governor. The course thus interrupted was never resumed, and the single lecture delivered by Dr. Jeffries is said to have been the first public one on anatomy given in New England.

JEHOVAH, the Hebrew name of the Supreme Being. Both the pronunciation and etymological derivation of this name are matters of critical controversy. The Jews of later periods from religious awe abstained from pronouncing it, and, wherever it occurred in reading, substituted the word *Adonai* (my Lord); and it is now generally believed that the sub-linear vowel signs attached to the Hebrew tetragrammaton *Jhvh* belong to the substituted word. Many believe *Jahveh* to be the original pronunciation. The name is derived by some

modern critics from names of Egyptian divinities, supposed to have been nationalized by Moses; by others it is compared with the Jove of the Romans. Its resemblance to two other Hebrew words for the Divinity, Jah and Ehyeh, in part strengthens and in part weakens these suppositions. What is certain is the connection of the word, whether original or not, with the Hebrew root *havah* or *hayah*, to be, and its meaning throughout the Scriptures "the Being" or "the Everlasting."

JEJEEBHOY, SIR JAMSETJEE, a public-spirited Parsee merchant of Bombay, born in that city, July 15, 1783, died there, April 14, 1859. His parents were poor, and like almost all the Parsee merchants he was the architect of his own fortune. In early life he made several voyages to China. In one of these the ship in which he sailed was captured by the French, and he was carried to the Cape of Good Hope, whence he found his way to Calcutta. He thus lost his property, and on several other occasions met with losses and vicissitudes; but by his resolution and business abilities he afterward became the first merchant of India, and died worth \$4,000,000. As early as 1822 he gave a proof of remarkable munificence in releasing the debtors confined in jail by paying their debts. From that time to his death his beneficence never slackened, and comprised all classes and creeds, his donations to public objects being estimated at about \$1,500,000. In 1842 he was knighted by the queen of England, and in 1843 a gold medal bearing the image of Victoria set in diamonds was presented to him by the British government, "in honor of his munificence and patriotism." Among his noblest charities is the great hospital in Bombay which bears his name, and which was opened in 1845. Connected with it, and also endowed by him, is the Grant medical college, which confers on India the benefit of a skilled body of native medical practitioners. In various parts of the country he built comfortable *dhurumsallas*, or places of refuge, for the convenience of travellers. An establishment at Bombay for the education and support of poor Parsee children was endowed by him at an expense of \$250,000. In one gift he devoted to the cause of education \$150,000, beside the schools which bear his name, and also contributed \$50,000 for a school of design. He established benevolent institutions not only in Bombay, but in Surat, in Nowsaree, in the Baroda territories, where his parents lived, and in many other places. The causeway which unites the islands of Bombay and Salsette, the water works at Poonah, the bridges at Earla, Parta, and Bartha, and many other public works, of which he was the founder, attest how greatly he contributed to the prosperity of the presidency of Bombay. In June, 1856, at a public meeting organized by the native population of that city, and supported by the Europeans of all classes, a statue was voted to him; and Lord Elphinstone, the governor of Bombay, said on that occasion: "It ought not to be forgotten

that, in addition to the great works which will endear his name to remote generations, his private, his almost secret charities have divided the weekly bread to thousands of his fellow creatures. The characteristic of his munificence has been enlightened usefulness. His wealth has been achieved by sagacity, industry, and the purest good faith; it has not been lavished with mere ostentatious and ill-considered profusion. In the long list of his public benefactions, there is not one which does not exhibit a wise discrimination, and amply deserve the title of good sense. Some have naturally been devoted to the relief and improvement of the members of that ancient faith in which he was himself born and nurtured, but the greater portion have solely contemplated the common good of all." His statue, that of the first native Indian placed by the side of the monuments of Elphinstone, Malcolm, and Forbes, was set up in the town hall of Bombay, and exposed to public view, Aug. 1, 1859. He was advanced to the dignity of a baronet of the United Kingdom by letters patent of Aug. 6, 1857. His wife, Awabae Franjee, the daughter of a Parsee merchant, bore her husband 3 sons, the eldest of whom, Cursetjee Jamsetjee, born Oct. 9, 1811, succeeded him in the baronetcy, while he and his brothers continue the extensive mercantile establishment of their father.

JELLACHICH DE BUZIM, JOSEPH, baron, ban of Croatia, Slavonia, and Dalmatia, and general in the Austrian army, born in Peterwardein, Military Frontier, Oct. 16, 1801, died in Agram, May 19, 1859. He was well educated in boyhood by his mother. Having been presented in his youth to the emperor Francis, he attracted his majesty's attention by his quick and bold wit, and was, as a favor, placed in the military academy, which he left at the age of 18 to enter as sub-lieutenant the dragoon regiment of his great-uncle, Baron Knesevich of Saint Helena, vice-ban of Croatia. Having been appointed in 1830 lieutenant of a frontier regiment of Hulus, he passed 4 years in Italy, and was afterward employed in suppressing bands of Bosnian robbers who made incursions into Croatia. After 3 years of this wild life, he became in 1837 major in the archduke Ernest's regiment, and adjutant to Count Lilienberg, governor of Dalmatia. In 1842 he was appointed colonel with full command of the first Banat border regiment. While engaged in military life he had carefully studied the political elements of his own country and of Austria. A revival of national spirit had lately shown itself among the Magyars as well as in the Slavic countries of S. E. Europe, the whole of these latter being kept in excitement by Russian influence and Pan-Slavic agitation. Croatia was united with Hungary, but its people saw with anger the rising power of the latter. When Hungary in 1848 rose for freedom, Jellachich lost no time in persuading his countrymen that fidelity to the Austrian rule was the only means of defending themselves against Hungarian ag-

gression. A committee was at once sent to Vienna to protest fidelity, and request for Jellachich the title of ban. The court granted the request, and Jellachich became ban, adding to this the title of privy councillor and general commander-in-chief of the districts of the Banat, Warasdin, and Carlsstadt. But many Croats saw with discontent this addition to Austrian power, and it became necessary for the ban to confirm his authority by strong means, in some instances in fact by the strong hand, as he is said in breaking up a political meeting of malecontents to have knocked down with his fist one whom he found haranguing against him. He had consolidated the southern Slavic tribes, and was endeavoring to join to their interests those of the Cechs of Bohemia. The Hungarian cabinet now demanded of the government that the ban should be deprived of his titles. The court began to play a double game, wishing on the one hand to flatter Hungary, and on the other to retain the aid of the Croats. Jellachich was nominally degraded and ordered to relinquish holding a diet, and then appear and account for his conduct. Without paying attention to the command, he went to Innsbruck after holding the diet and having himself consecrated ban by the bishop. He now visited the archduke Charles and the archduchess Sophia, by whom he was heartily welcomed, nothing being said of the degradation or attain of treason. At Innsbruck, before the emperor and imperial family, "this darling rebel," as the archduchess Sophia termed him, delivered a long oration, declaring the readiness of himself and people to die for Austria. This was the heaviest blow struck at Hungary, and the ban returned in triumph. He now crossed the Drave and advanced against the Hungarians as far as Stuhlweissenburg, but was repelled, fled toward the Austrian frontier, and joined the forces of Windischgrätz, who was besieging Vienna, then in the hands of the insurgents. He contributed to the defeat of the Hungarians at the battle of Swechat (Oct. 30), as well as to the conquest of Vienna. He now coöperated with Windischgrätz in the invasion of Hungary, surprised and dispersed the retreating army of Perczel at Moor (Dec. 29), and took part in the indecisive campaign of Feb. 1849. But in the following April, the Hungarians commanded by Görgey defeated the Austro-Croat army under the chief command of Windischgrätz; and on July 14 the ban, who subsequently operated in the south of Hungary, was completely beaten at Kis Illegyes. While reorganizing his troops, Haynau and Paskevitch finally subdued the Magyars. During this campaign Jellachich was in fact more distinguished for policy and tact than military talent. In 1853 he commanded an army of observation on the borders of Bosnia. His *Gedichte*, or "Poems," were published at Vienna in 1850, and his soldier songs are popular in the army.

JELLY, the juice of certain fruits or vegetable roots boiled down with about its own weight of sugar, or a preparation of animal

gelatine. The effect of the sugar in the former is to give the juice a more gelatinous consistence, an agreeable sweetness, and render it less liable to change. Isinglass is also sometimes used to increase the stiffness of the jelly. The product differs from animal jelly (see GELATINE) in containing no nitrogen, and it is not esteemed particularly nutritious; but it forms a pleasant article of diet, and to the sick a cooling and grateful refreshment. Jams are also preserves of fruit with sugar. They differ from jellies in containing the pulp and sometimes seeds as well as the juice. The insoluble and indigestible ligneous matters of the fruits render them less suitable for the sick, but in a healthy state of the system these matters no doubt promote the action of the bowels by their mechanical stimulus. Vegetable jelly consists chiefly of the acid called pectic, which is produced by the change effected upon the chemical principle pectine of Braconnot, so named by him from the Greek *πηκτος*, congealed, in reference to its property of gelatinizing. Pectic acid is almost insoluble in cold water, and when dissolved in boiling water it coagulates on cooling. Long continued boiling, however, deprives it of this quality, and the product is mucilaginous. Hence in making currant or other jelly, the boiling is not extended beyond 20 minutes. Sufficient sugar must be used to absorb the water, so that longer boiling than this is not required to evaporate it.

JELLY FISH, the popular name of the aculephoran class of radiated animals, or *medusæ*, including the orders *siphonophoræ*, *discophoræ*, and *ctenophoræ*. The body is transparent and jelly-like, disk-shaped, with the mouth downward and in the centre of the enclosed cavity, from which hang down appendages varying in number, length, and purpose. In the genuine medusæ, of which the sun fish (*aurelia*), so common on our beaches after storms or floating in our waters in the summer, is a good example, the body is so largely made up of water that on drying it is reduced to a mere film of membrane; they would hardly be seen in the water, were it not for their beautiful colors. The digestive cavity is more complex than in the polyps, being excavated in the substance of the body with branches ramifying in various directions; the stomach seems to perform the office of a heart, distributing the products of digestion over the system, and the food, arriving at the periphery, escapes by as many openings as there are traversing tubes; on the free margin are generally numerous minute tentacles, forming beautifully delicate appendages, which absorb water into the marginal canal in contact with the food; digestion is rapidly performed; the circulation of the digested materials is irregular, sometimes in one direction and sometimes in another. The bunches of colored eggs generally hang outside the tentacles which surround the mouth; in some, red specks between the tentacles have been conjectured to be eyes. The common jelly fishes move by the alternate contractions and dilatations of the gelatinous

disk; others, like the Portuguese man-of-war (*physalia*), have a large vesicle which supports the whole community at the surface of the ocean, motion being effected by the numerous contractile tentacles and the contractions of the air bladder (*siphonophoræ*); others (the *ctenophoræ* or beroid medusæ) move by means of vertical series of swimming appendages resembling the fins of a crab. This class presents the curious phenomena of alternate generation, illustrated by Steenstrup, Sars, and others, noticed also in other classes of the animal kingdom, especially the helminths or entozoa. The *tubularia*, common in pools left by the tide, a hydroid growing in tufts like small shrubs, hangs like a flower from a slender tube, with the mouth surrounded by tentacles, each animal connected with the rest of the community, and each mouth receiving nutriment for the whole; the young of this hydroid do not resemble the parent, but are little, delicate, translucent jelly fishes, like tiny cups from which hang down 4 long threads, and a proboscis at whose end is the mouth; beside the buds which branch out from the parent are hanging bunches of little spheres from which the jelly fishes are produced; along the proboscis of the floating cup are other spheres or eggs, from which are produced little pear-shaped bodies, which become attached and grow into the first mentioned branching hydroid. It will thus be seen that the grandchild resembles the grandparent, and the hydroid is reproduced through a generation of jelly fishes into a hydroid again; if the first be a *coryne*, the jelly fish would be a *sarsia*. The name of jelly fish is here applied like those of star fish, shell fish, &c., merely implying that it dwells in the water, without being in any way connected with vertebrate fishes. Some small single hydroids, not more than $\frac{1}{2}$ inch high, produce some of the largest jelly fishes; as the one which by subdivision into saucer-like contractions forms the *ephyra*, with a marginal fringe of tentacles. In our common white sun fish, the 4 crescentic rosy figures, forming a cross by their union in the centre, are accumulations of eggs. Some of the jelly fishes in our waters formed from these self-dividing hydroids are as large as the largest wash tub, with tentacles extending 20 or 30 feet; these are of a deep claret color, and possess in a remarkable degree the stinging or nettling property which has given the scientific name to the class. In the Portuguese man-of-war, some of the community move the whole establishment, some secure prey with their lasso cells and eat and digest for the family, and some produce the buds from which the young jelly fishes arise; and none of these take up or interfere with the work of the others. In the same way the hydroid *campanularia* produces the jelly fish *tiaropsis*, with its edge beautifully fringed. Some very handsome jelly fishes do not originate from any hydroid, but reproduce themselves in the usual way by eggs, the children resembling the parent. These delicate and transparent creatures are worthy of

careful study, from their structure, mode of reproduction, and relations to other animals. For the greater part of the year the eggs remain torpid, then a polyp-like vegetation arises, with buds which flower-like become rapidly developed into more highly organized free jelly fishes; these animal flowers, as they have been called, are so sensitive that they are instantly killed by a change from salt to fresh water. They are very voracious, feeding upon minute fishes, crustaceans, almost any small marine creatures, decaying animal or vegetable matters, and even their own species; they move with the rapidity and elegance of birds of prey, securing their victims with precision by means of their nettle-armed tentacles, and performing these acts in a manner which would hardly be expected in a transparent mass of jelly. A nervous system is present; and the form is in many capable of remarkable changes. For details on their structure, see Forbes's work on the British naked-eyed medusæ; two papers by Prof. Agassiz, in the "Memoirs of the American Academy of Arts and Sciences," vol. iv. part 2, 1850; and vol. iii. of Agassiz's "Contributions to the Natural History of the United States" (4to., Boston, 1860). The well known phosphorescence of the ocean is in great measure due to the light emitted by jelly fishes, shining like globes of fire, sparkling like stars, or diffusing a pale luminousness; this is most remarkable when the water is agitated by a vessel's keel, and on the coast line or amid breakers, where these creatures often serve to mark the course of the mariner. The number of these jelly fishes, often very minute, is beyond calculation or expression, especially in northern waters, where they form the food of the small crustaceans and other animals upon which the right whales feed, and are also themselves devoured in immense numbers by these huge cetaceans.

JEMMAPES, or GEMAPPE, a village of Belgium, in the province of Hainaut, situated on the river Haine and on the canal from Mons to Condé, 3 m. W. from Mons; pop. 4,670. It is noted for a battle, Nov. 6, 1792, between the French under Dumouriez and the Austrians under the archduke Albert. The republican forces numbered about 40,000; the Austrian army was equally strong, but it was so posted that only its centre, consisting of 18,000 men, could be brought into action. These troops were intrenched, however, between Jemmapes and Mons, and their position was defended by 14 redoubts, mounting nearly 100 pieces of artillery. The battle began at daybreak with an attack by a French column under Gen. Beurnonville, who succeeded after a violent struggle in turning the Austrian flank and carrying the redoubts on the left of the line, while at the same moment Dumouriez led his centre against the village of Jemmapes. Here they were thrown into confusion by some squadrons of the imperial horse, but the heroism of a valet of Dumouriez named Baptiste, and of the young duke of Chartres (afterward King Louis Phi-

lippe), rallied the discomfited troops, and drove the Austrians from the field. Dumouriez meanwhile hastened to the right, where Beurnonville's column was beginning to waver, and inspired the soldiers with such enthusiasm that, shouting the Marseillaise, they rushed upon the redoubts and completed the victory. The Austrian loss was about 5,000, the French 6,000; but the consequences of the battle, the first regular engagement won by the republican forces, were very important to both parties. Most of the cities of the Netherlands surrendered to the victors without opposition; and when Belgium was subsequently annexed to the French empire Jemmapes gave its name to a province comprising nearly the whole of Hainaut.

JENA, a German town, situated on the Saale, in the grand duchy of Saxe-Weimar-Eisenach, partly surrounded by steep barren mountains, and consisting of the town proper, through which flows the little river Leutra, and several suburbs; pop. about 6,000. It is the seat of a supreme court for the grand duchy, and for several neighboring duchies, and contains a ducal palace, 3 Lutheran churches, a Roman Catholic church, 3 hospitals, a lunatic asylum, &c. The country around Jena is so beautiful that Charles V. is said to have placed it in that respect next to Florence. The foundation of its celebrated university was laid by the elector John Frederic the Generous in 1547, when as a prisoner of Charles V. he was removed to Jena, where he was to meet with his three sons. The university of Wittenberg having been wrested from him, his object was to establish in its stead a seat of learning at Jena which should become a nursery of science and of the doctrines of the reformation. Among the first professors who lectured at Jena were Stigel the philologist, Striegel the theologian, and Schröter the physician. The latter prevailed upon Ferdinand I. to give his sanction to the institution (Aug. 15, 1557); it was inaugurated Feb. 2, 1558, and the 300th anniversary was celebrated Aug. 15-17, 1858, on which occasion a statue of the founder John Frederic was placed in the market square. In connection with the university are a philological and theological seminary, a clinique, an anatomical theatre, an obstetric and pharmaceutical establishment, an institution for natural and mathematical sciences, one for agricultural science, and another founded in 1849 for political science, a botanical garden, an observatory, a museum of mineralogy, natural curiosities, archaeology, and oriental coins, and a library with 150,000 vols. (removed in 1858 to a new and stately building). Jena holds a high position in German literature, particularly in philosophy. Reinhold, Wieland's son-in-law, a disciple of Kant, was called in 1787 to Jena, where he opened his lectures on the new philosophy, which were attended by an unprecedented concourse of students. From that time this university became the source whence philosophy, æsthetics, and biblical criticism flowed over all Germany. Fichte, Schel-

ling, and Hegel were all connected with Jena. Schiller's favorite resort while professor of history there was the garden in which the observatory now stands. Among the other eminent scholars and poets who have held office in the university were Voss and the brothers Schlegel; among naturalists, Oken; in chemistry, Götting and Döbereiner; in theology, Danov, Griesbach, Eichhorn, and Paulus; in jurisprudence, Feuerbach, Thibaut, &c. In the middle of the 18th century the attendance of students fluctuated between 2,000 and 3,000; at the end of that century there were still about 1,000. The student associations (*Burschenschaften*) and political agitations in 1815-'19, as well as the fact that the student Sand happened to be at Jena shortly before his assassination of Kotzebue, and the competition of the new universities, greatly injured the prosperity of Jena, and the attendance has since declined to about 500, although the different duchies which support it have increased in their solicitude for its welfare. The number of professors is now about 50, among whom are many men of great learning, as Droysen, Grimm, Hase, Wackenroder, &c. The first literary periodical in Germany was established in Jena in 1785. After its removal to Halle, it was followed from 1804 to 1842 by the *Jenaische Literaturzeitung*, and since by the *Neue Jenaische Literaturzeitung*, published by Brockhaus in Leipzig with the coöperation of the faculty. Jena has several other private educational institutions, a musical union, and a society for the study of Thuringian history and archaeology founded in 1852.—A memorable battle was fought near Jena, Oct. 14, 1806, between the Prussian and Saxon army and the French. Napoleon's victory at Jena, says Schlosser, destroyed one half of the Prussian army, while Davoust gained a much more glorious victory over the other at Auerstädt. This double defeat brought about the complete humiliation of Prussia.

JENNER, EDWARD, an English physician and surgeon, celebrated for his discovery of vaccination, born in Berkeley, Gloucestershire, May 17, 1749, died there, Jan. 26, 1823. He was the 3d son of the Rev. Stephen Jenner, vicar of Berkeley, and, having evinced a taste for the study of natural history and medicine, he was apprenticed at the age of 14, in accordance with the practice of the time, to a surgeon in Sudbury, near Bristol, with whom he remained 7 years. At the age of 21 he went to London and became a pupil of John Hunter, then rising into eminence as a surgeon and physiologist, with whom he remained 2 years, and between whom and himself a lasting friendship was established. In the interval he was employed, at the recommendation of Sir Joseph Banks, to arrange the specimens of natural history brought back by Capt. Cook from his first voyage of discovery; and so satisfactorily did he discharge this duty that he received the appointment of naturalist to the expedition which sailed in 1772. Preferring the profession for which he had been

specially educated, he declined this offer, as well as others equally flattering and lucrative subsequently made to him, and in 1773 returned to Berkeley, where he established himself in practice as a surgeon and apothecary. In 1792 he procured from the Scottish university of St. Andrew's the degree of M.D., and thenceforth devoted himself exclusively to the practice of medicine. In the intervals of his professional labors he occupied himself with various scientific researches, and derived much pleasure from music, literature, and the recreations of society. The versatility of his genius is seen in his correspondence with John Hunter, whose communications to the "Philosophical Transactions" gave frequent evidence of his pupil's researches into the economy of the animal and vegetable kingdoms. His paper on the cuckoo communicated to Hunter, and by him published in the "Transactions," was considered a masterly performance, on account of the many new facts with regard to the habits of the bird which it disclosed, and was the occasion of the author's election to the fellowship of the royal society. Geology, pharmaceutical and agricultural chemistry, and various organic diseases of the human body, also afforded him subjects for investigation, and he was a frequent contributor of important original papers to two medical clubs formed for the purpose of communicating professional information and of cultivating friendly intercourse. Amid these diverse occupations he steadily developed the idea of the great discovery with which his name will ever be associated. As early as during his apprenticeship at Sudbury his attention had been directed to the subject of a preventive of small pox, by hearing a young countrywoman, who had come to his master's surgery for advice, say that she could not take that disease because she had already had the cow pox. Upon inquiry he ascertained that in Gloucestershire persons engaged in milking cows frequently had the cow pox, a mild disorder of the eruptive kind appearing on the udder of the animal, and communicated in a similar form to their hands; that it had never been known to prove fatal when thus communicated; and that the belief was common among the agricultural classes that whoever had taken the disease was secure against the infection of small pox. Far from treating this popular notion as a vulgar error, founded upon superstition or credulity, he immediately commenced a serious examination of it, and was soon led to conjecture that cow pox, as the milder disease, might advantageously supersede the inoculated small pox, which had been introduced about 50 years previous; and that as the latter is rendered less virulent by inoculation, so the former, introduced in the same way, might be milder than the casual complaint, and yet retain its protecting power. Upon going to London in 1770 he communicated this conjecture to Hunter, who made public mention of it in his lectures, but advised his pupil "not to think, but try." Upon returning to Berkeley

he pursued the subject with great patience and sagacity for many years, in the course of which he made a thorough study of the various forms of varioloid eruptions and their distinguishing characteristics. It was not until after frequent experiments that he ascertained that only one form of the eruption on the cow's udder had the property of protecting from the small pox, and such was his faith in his discovery that several of these experiments were made upon his own son, a boy under 6 years of age. During all this time he made no secret of the investigations he was conducting, but met with little sympathy or encouragement from his professional brethren; and so distasteful did his speculations prove to the members of one of the medical societies to which he belonged, that he was forbidden to indulge in them at their regular meetings under penalty of expulsion. Having satisfied himself of the efficacy of inoculation with the virus of the cow pox to prevent the small pox, he next ascertained with equal certainty that the former disease could be communicated from one human being to another, without having recourse to the original vaccine matter. He was the more willing to accept this conclusion, from the fact that frequently for years together the disease disappeared from the cattle; so that unless the virus could be communicated directly from one individual to another, the difficulty, not to say the impossibility, of obtaining it from the cow's udder, would greatly impair the value of his discovery. On May 14, 1796, an anniversary still celebrated in several parts of Europe, he vaccinated James Phipps, a boy 8 years of age, with virus taken from a pustule on the hand of a milkmaid, who had been infected by her master's cow. On July 1 the boy was inoculated for the small pox, and, as Jenner had predicted, without the slightest effect; and he lived to be inoculated 20 times for the small pox, with the same result in each case. For two years afterward he continued his experiments in this direction, and in 1798 went to London to communicate the process to the profession, and to endeavor to procure its general adoption. His reception was disheartening in the extreme. Not only did the doctors refuse to make trial of the process, but the discoverer was accused of an attempt to "bestialize" his species by introducing into their system diseased matter from a cow's udder; vaccination was denounced from the pulpit as "diabolical;" and the most monstrous statements respecting its effects upon the human system were disseminated and believed. At the end of 3 months he returned to Berkeley; but, undiscouraged by the popular prejudice against vaccination, he published in the same year his "Inquiry into the Causes and Effects of the Variolæ Vaccinæ," in which he gave the details of 16 cases of the casual and 7 of the inoculated disease. In this work he also expressed the opinion that the disease in the horse's heel known as the grease was identical with the cow pox. The "Inquiry" did not fail to challenge attention, as the facts

described in it were incontrovertible; but the first impulse toward the adoption of the new practice was given by the successful vaccination of several persons in London by Mr. Cline, a surgeon, with whom Jenner on his return to Berkeley had left some vaccine lymph; and so sudden was the reaction in favor of Jenner, that in less than a year after his departure from London a manifesto expressive of confidence in his discovery was signed by 73 of the most eminent practitioners of the metropolis. Several of his medical brethren even undertook to rob him of the merit of his discovery; and one of these, a Dr. Pearson, in coöperation with Dr. Woodville, physician to the small pox hospital, brought vaccination into temporary disrepute by using and distributing matter from persons who had been inoculated with small pox a few days after vaccination, and before the vaccine matter had taken a sufficient hold. Jenner promptly exposed this mistake in his "Continuation of Facts and Observations relating to the Variolæ Vaccinæ" (1800). In 1800-'1 the "Inquiry" was translated into the principal continental languages, and within the next 5 years flattering testimonials from crowned heads and scientific bodies poured in upon him in abundance, and his discovery was hailed as an incalculable benefit to the human race. In 1802, not without considerable opposition, a parliamentary grant of £10,000 was voted to him; and so encouraging did his prospects appear that in 1803 he took a house in London, with a view of commencing practice there. He was however deceived in his expectations, and returned in the succeeding year to Berkeley, where he continued as before to vaccinate gratuitously all poor persons who applied to him on stated days. In 1803 the royal Jennerian society for the encouragement of vaccination was established, with himself as president, but was subsequently by his advice merged in the national vaccine establishment, which still exists. So inadequate had been the parliamentary grant to compensate him for his outlays and sacrifices in the prosecution of his discovery, that in 1807 a further grant of £20,000 was voted him, and he subsequently received between £7,000 and £8,000 from India. The latter years of his life were passed in Berkeley in professional pursuits and scientific researches; and he also labored unremittingly and successfully to diffuse the blessings of his discovery over the civilized world. His death took place in consequence of a sudden attack of apoplexy. Few persons have been more willingly or universally recognized as benefactors of their kind; and so potent was the influence of his name, that on several occasions his personal application to the emperor Napoleon was efficacious to procure the release of English prisoners, when diplomatic negotiations would probably have failed. In the same manner he interceded successfully with the Spanish and Austrian governments. It is even said that certificates signed by him in the hands of Englishmen travelling on the continent had

the effect and force of real passports. His most prominent moral characteristic was his benevolence, which was the chief incentive to his discovery, and which presided over every prominent act of his life. In none of them was it more conspicuous than in his voluntary promulgation of the method and the advantages of vaccination, which he might have made the source of large professional emolument had his philanthropy been less active. In all the relations of life he manifested a sincere and unostentatious piety, a genial temper, much warmth of affection, and a charm of manner and conversation which made him the delight of the social circle. His intellectual powers are abundantly shown in the account of his great discovery, of which Cuvier has said: "If vaccination were the only discovery of the epoch, it would serve to render it illustrious for ever." Two attempts have been made to erect a monument to him by public subscription, the former of which partially succeeded. On the latter occasion the warmest interest was manifested in the United States. His statue was placed in Trafalgar square, London, in 1858. His life by Dr. John Baron, with his correspondence, was published in 1827-'38 (2 vols. 8vo.).

JENNINGS, a S. E. co. of Ind., drained by tributaries of Muscatatuck river; area, 375 sq. m.; pop. in 1850, 12,096. The surface is diversified, and the soil is moderately fertile. The productions in 1850 were 516,053 bushels of Indian corn, 62,843 of wheat, 78,274 of oats, and 5,701 tons of hay. There were 16 grist mills, 27 saw mills, 1 newspaper office, 30 churches, and 1,857 pupils attending public schools. The Madison and Indianapolis and Ohio and Mississippi railroads intersect each other at Vernon, the capital.

JENNINGS, WILLIAM, an English miser, born in 1701, died in 1797. He was of a respectable family, his father having been an aide-de-camp to the duke of Marlborough and on terms of intimacy with William III., who officiated as godfather at the baptism of the son. In early life William Jennings was a page to George I., but upon attaining his majority he retired to a magnificent country seat in Suffolk which had been left unfinished by his father, where he passed the greater part of his life. He never attempted to complete the building, but lived in apartments on the basement floor in a style of penury rivalling that of his neighbor John Elwes, equally celebrated for his parsimony. The remainder of his life was devoted to the accumulation of money, and at his death he possessed in real and personal property upward of £1,000,000. Like Elwes he also frequented Brookes's and other gambling clubs in London, but less for the purpose of play than to lend money to the unlucky, from whom he extorted an enormous interest; and so profitable did this business prove that, until he was incapacitated by bodily infirmities from pursuing it, he was frequently in the habit of spending the fashionable season in London. He died a

bachelor, leaving a will sealed but not executed; and the disposition of his immense property, now said to amount to £2,000,000, has during the last 60 years formed a fruitful subject of inquiry to persons in England and the United States claiming to be his legal heirs.

JENYNS, SOAME, an English author, born in London in 1704, died there, Dec. 18, 1787. He finished his education at Cambridge. His first production was a poem on the "Art of Dancing," which appeared in 1730. From that period he occasionally indulged in literary composition, until in 1742 he was returned to parliament as member for Cambridgeshire. In 1755 he was appointed one of the commissioners of the board of trade and plantations. In 1757 he published his "Free Inquiry into the Nature and Origin of Evil," which elicited from Dr. Johnson, in the "Literary Magazine," one of his severest criticisms. In 1767 he issued a pamphlet entitled "Thoughts on the Causes and Consequences of the Present High Price of Provisions;" and in 1776 the most important of all his works, "A View of the Internal Evidence of the Christian Religion," in which he avowed his early scepticism and recent conversion. As a prose writer Jenyns was remarkable for the purity and grace of his style. His poems found admission into the later editions of Johnson's "Poets." A complete edition of his works was published in 1790 (4 vols. 8vo., London).

JEPHTHAH, the 9th judge of Israel, natural son of Gilead, was after the death of his father exiled by his half brothers, and dwelt in the land of Tob. There he gained renown for his exploits as a leader of a band of border rovers, and was at length chosen by his countrymen the Gileadites to be their commander in a defensive war against the Ammonites. He, however, chose to attack the enemy in their own country. Before he took the field, he made an oath that if he were victorious he would sacrifice to the Lord whatsoever should first come forth from his house to meet him on his return. He conquered the Ammonites, and, having returned, his daughter, an only child, issued from his house to greet him with timbrels and with dances. It is stated that at her own request "he did with her according to his vow," but some commentators suppose that he only consecrated her to perpetual virginity. Jephthah ruled Israel for 6 years. The sacrifice of his daughter is the subject of oratorios by Handel (1751) and Reinthaler (1855).

JERBOA, the principal old world representative of the rodent sub-family *dipodina*, characterized by greatly developed hind legs for taking long leaps, diminutive fore legs, long hairy tail, and large infra-orbital foramen. The best known species is the Egyptian jerboa (*dipus ægyptius*, Licht.). The incisors are slender and sharp, the upper ones grooved, 2 above and 2 below; the molars, $\frac{3}{2}$ - $\frac{3}{2}$, are complex, furnished with roots; the head is large, with prominent eyes, moderate pointed ears, and silken whiskers 6 inches long.

In external conformation it somewhat resembles the kangaroo, having an elongated body thickest behind, the posterior limbs very much larger than the anterior; the neck is very short, and the 6 lower vertebrae are frequently found united together; the metatarsus consists of a single bone; there are 5 toes on the short fore feet, and 3 on the posterior, armed with obtuse claws; the tail is long, with hairs set in two rows, and tufted at the end; it is not, however, thick at the base, as in the kangaroo, though it is used to sustain the body in the act of leaping, its usual mode of progression. The body is about as large as a rat's, of a fawn color above and white below, the black tuft of the tail white tipped. From its generic name, which signifies two-footed, it has been supposed that the jerboa walks entirely on the hind feet; but the animal walks upon 4 feet, resorting to its prodigious leaps only when alarmed; when about to spring, it raises itself on the end of the hind feet, with the support of the tail, the fore feet close to the breast; the body comes down on the fore feet, but is elevated again so quickly that it appears constantly in the air. All the species are clavicated, and carry their food to the mouth with the fore paws; they pass the winter in burrows in a state of lethargy; they are difficult to keep in captivity, even in their own climates; the females are generally the largest, and have 6 or 8 young. The Egyptian species lives in troops in northern Africa, most abundantly in the sandy regions and ruined places of Egypt; it extends as far north as the Caspian sea, and into Syria and Arabia; it is restless and timid, and can be taken only by surprise. The Arabians take jerboas alive in their burrows; their flesh is eaten by the Egyptians, and their soft and shining fur is valued by them; their food is exclusively vegetable, and they are said never to drink. The *D. sagitta* (Gmel.), found between the Don and Volga, is by some considered a variety of the common species. The largest species is the *seirtetes jaculus* (Wagn.), about 9 inches long, found in the steppes between the Donetz and the Don and in the Crimea; this is the *alak-daaqha* of the Mongols. It has one more upper molar on each side, and all are rather more complex in structure; the hind feet are 5-toed, the 2 lateral ones small, and the tail and ears are longer. The fur is soft, yellowish fawn varied with grayish brown above; the under parts, interior of limbs, end of nose, and crescent on the nates are white. The general appearance and habits are as in the common species; they become lethargic both under slight cold and great heat; the food consists of succulent plants, roots, fruits, insects, and, it is said, of small birds and of each other; they dig very rapidly into the earth, and live in burrows with many openings; their swiftness is such that it is difficult to overtake them even on horseback; their flesh is also esteemed as food. Other species are found in the steppes around the sea of Aral and the E. coast of the Caspian.—To this family also be-

long other jumping rodents, often called jerboas. Among them is the jumping hare of S. Africa (*pedetes Cafer*, Illig.), with molars $\frac{4}{3}$ without roots, long ears, 5 toes on the fore feet and 4 on the hind, with long claws; the posterior limbs and tail are long, the latter tufted. It moves by great leaps, and sleeps by day; it is as large as a rabbit, of a fawn color, with the end of the tail black. In North America is the jumping mouse (*jaculus Hudsonius*, Zimm.), about 10 inches long, of which the tail is more than half; the color is red-brown, darker on the back, the sides and under parts white. It is found as far north as the Great Slave lake. The molars are $\frac{4}{3}$; the hand has 4 fingers with a rudimentary thumb, hind feet 5-toed, hind legs and tail very long, the latter thinly haired; the upper incisors grooved longitudinally in front. For full details on this genus, see vol. viii. of the reports of the Pacific railroad survey.

JERDAN, WILLIAM, a British journalist, born at Kelso, Roxburghshire, Scotland, April 16, 1782. He acquired a tolerable education at various public and private schools, and, after being unsuccessfully engaged as a merchant's clerk and as a student of law, succeeded in 1805 in getting employment in the staff of the "Aurora" newspaper. During the next 12 years he was actively employed by a number of metropolitan and provincial journals, and for several years edited the "Sun." In July, 1817, 6 months after the establishment by Mr. Colburn of the "Literary Gazette," Mr. Jerdan became its editor, and ultimately sole proprietor, a position which he occupied until 1850, when pecuniary embarrassments led to his withdrawal. Under his control the "Gazette" acquired a reputation for the impartiality and intelligence of its literary criticisms. After his retirement he received from the administration of the earl of Aberdeen a pension of £100 in acknowledgment of his literary services, and a large subscription was raised for him. He is the author of the biographies in Fisher's "National Portrait Gallery," and in 1852-'3 published his "Autobiography," in 4 vols., an interesting record of his literary, political, and social reminiscences during a period of nearly 50 years. Mr. Jerdan was instrumental in developing the poetical genius and critical abilities of Miss Landon, for many years his collaborator in the "Literary Gazette."

JEREMIAH (raised up by God), the 2d of the great Hebrew prophets, son of Hilkiah, one of the priests of Anathoth, prophesied under the reigns of Josiah, Jehoahaz, Jehoiakim, Jehoiachin, and Zedekiah, and after the conquest of Jerusalem by the Babylonians, from about 628 to 570 B. C. He was but a youth when he received the divine appointment in his native city. The persecutions of his townsmen drove him to Jerusalem, where, in spite of opposition and imprisonment, he remained true to his mission, keeping firmly in view the religious and political rectitude of the state. After the death of Josiah he was assailed by priests and prophets, and saved his life only to be cast into prison,

where he wrote some of his predictions, which were read to the assembled people by Baruch, but burned by King Jehoiakim. After the capture of Jerusalem by Nebuchadnezzar he was spared by the conqueror in consideration of his having advocated voluntary submission to the rule of Babylon, and he went first to Mizpah, and afterward to Egypt. There are various traditions concerning his last years and his death. A grotto is still pointed out at Jerusalem where he is said to have composed his Lamentations, and his grave is shown at Cairo. His extant writings, all of which are of a plaintive character, embrace the book containing his prophecies, and, according to general belief, the metrical book of Lamentations. An elegy on the death of King Josiah, ascribed to him, is lost. Among the more recent commentators on Jeremiah are Hitzig (Leipsic, 1841), Umbreit (Heidelberg, 1843), and Neumann (Leipsic, 1856). There is an English translation and commentary by Blayney (Oxford, 1784; new ed., Edinburgh, 1810), and by Prof. G. R. Noyes, D.D. (Boston, 1837).

JEREMIE, SIR JOHN, an English colonial judge, born in Guernsey, Aug. 19, 1795, died in Port Lago, Sierra Leone, April 23, 1841. Having completed his education at Dijon in France, he studied law, and commenced its practice in his native island. In Oct. 1824, he was appointed chief justice of St. Lucia, West Indies, and in 1832 was made procureur and advocate-general of Mauritius. The inhabitants of the colony, having been accustomed to see the office filled by a member of their own community, were so hostile to him, that the governor ordered him to leave the island and return to England. But on his arrival in London the home government sent him back with a force adequate to uphold his authority, and he maintained his position there, in defiance of public opinion, till 1835. In 1836 he was promoted to the rank of puisne judge of the supreme court of Ceylon, which office he held for 4 years. He had been in early life an opponent of negro emancipation, but his observation of slavery in the West Indies had made him a zealous abolitionist; and in 1840, from a desire to aid in ameliorating the condition of the Africans, he became governor of Sierra Leone and its dependencies, receiving at the same time the honor of knighthood. He was the author of "Four Essays on Colonial Slavery" (London, 1831).

JERICHAU, A., a Danish sculptor, born in Copenhagen in 1815. After a partial education in his art at home, he repaired in 1839 to Rome, where he received the instructions of his countryman Thorwaldsen, and where he now resides. His chief works are the "Marriage of Alexander and Roxana," a bass-relief, in one of the royal palaces in Copenhagen; a colossal group of Hercules and Hebe; a fine statue in marble of Penelope; "A Hunter devoured by a Lioness whose Whelps he has stolen;" and an "Ascension." He belongs to the classical school, and aims at purity of form and force of expression.—His wife, ELISABETH (BAUMANN),

born in Warsaw, Poland, in 1820, a pupil of the academy at Düsseldorf, has gained considerable eminence as a painter of *genre*.

JERICHO, a flourishing commercial city of ancient Palestine, in the vale of the Jordan, on the W. side of that river, near its entrance into the Dead sea. It was one of the oldest and richest cities of Canaan, surrounded by groves of palms and balsam trees. It was conquered and destroyed by Joshua on his entrance into the promised land, and a curse pronounced upon whomsoever should rebuild it, its territory being allotted to the tribe of Benjamin. It was however restored, became the centre of the trade between Arabia and Palestine, was fortified by King Abab, and became the seat of a school of prophets. Mark Antony presented its plain of palm trees to Cleopatra. It was embellished by Herod the Great, who built there one of his residences; under Vespasian it was destroyed, and under Hadrian rebuilt; it was overthrown during the Mohammedan conquest, revived under the Saracens, and completely destroyed during the crusades. The village of Richa, which occupies its site, consists only of a few huts and a Saracenic tower.

JERICHO, ROSE OF (*anastatica Hierochuntina*, Linn.), a climbing shrub, with a fragrant, singularly shaped, greenish yellow blossom. According to a legend, it grew in the desert in the places which the Virgin Mary touched on her flight into Egypt. When dried, its leaves and blossoms fold together upward, but open again when placed in water, and this process can be many times repeated; whence its generic name, from Gr. *αναστασις*, resurrection. It is fabled to blossom only on the great festivals, especially on Christmas. It is indigenous in Egypt and Palestine, and was probably brought to Europe by the crusaders.

JEROBOAM I., founder of the kingdom of Israel, son of Nebat, of the tribe of Ephraim, became king in 975, died in 954 B. C. He was selected by Solomon to be a superintendent of the public works which he was carrying on at Jerusalem. Informed by the prophet Ahijah that he was to rule the 10 tribes which should revolt from the house of David, he immediately engaged in plots against Solomon, and fled to the court of Shishak, king of Egypt, to escape punishment. On the death of Solomon, he returned from Egypt, headed the deputation of the chiefs of tribes which met Rehoboam at Shechem and whose demands were rejected, and was then elected by 10 of the tribes to reign over them, with the title of king of Israel, Judah and Benjamin alone remaining to Rehoboam. He resided at Shechem, which he fortified, built temples at Dan and Bethel, where golden calves were made the symbols of the Divinity, to which his subjects might resort rather than to Jerusalem, and was generally successful in his wars against Judah, though he was defeated in a great battle by Abijah. The leading aim of his government was to raise a barrier against any reunion of the tribes.

JEROME, a saint and doctor of the Latin church, born in Stridonium, on the confines of Pannonia and Dalmatia, about 342, died Sept. 30, 420. He was the son of wealthy Christian parents, who gave him a good education. About 363 he went to Rome, and studied for several years under the grammarian and commentator Donatus and the rhetorician Victorinus, displaying great aptitude for learning. He received baptism here, but his thoughts were bent more upon secular than religious aims. He pleaded at the bar for a while, and then sought to improve his mind by travel, visiting the chief cities of Gaul, passing, it has been supposed, into Britain, and studying for some time at Aquileia. At Treves, about 370, he resolved to devote himself to God, and took a vow of perpetual continence. Wishing for a complete retirement in some distant country, he attached himself after his return to Rome to the eastern priest Evagrius, and, in company with 3 other persons of similar dispositions, followed him to Antioch, where he heard the lectures of Apollinaris, who had not then promulgated his heresy. From Antioch he withdrew in 372 to a desert on the borders of Syria and Arabia, where he spent 4 years in the exercises of a cenobitical life, dividing his time between the severest practices of self-mortification and the study of Hebrew and the classics. Two of his companions died here; Heliodorus, the third, returned to the West; and Jerome himself, broken in health by his penances, returned to Antioch in 376. Paulinus, Meletius, and Vitalis each claimed to be bishop of this see. Jerome, having consulted Pope Damasus, acknowledged the first, and was ordained priest by him in the following year. Distressed by the doctrinal controversies of the Arians and Sabellians, he left Antioch for Palestine, visiting all the holy places, but making Bethlehem his usual residence. About 380 he went to Constantinople, where he studied the Holy Scriptures under St. Gregory Nazianzen. In 381 he returned to Palestine, and the same year accompanied Paulinus and St. Epiphanius to the council held at Rome concerning the schism of Antioch. He remained at Rome as secretary to Pope Damasus, and at the same time directed the studies and devotions of a number of noble ladies. His severity in reproving the reigning vices of the day raised him up many enemies, whose persecutions after the death of Damasus drove him back to the East in 385. He visited Antioch, Jerusalem, and Alexandria in Egypt, and finally retired to Bethlehem, where St. Paula, who had followed him from Rome, built for him a monastery, and put under his charge a community of nuns which she had also founded. St. Jerome added to his monastery an asylum for the entertainment of pilgrims. In 417, after the council of Diospolis, the Pelagians sent to Bethlehem troops of armed men, who killed a deacon, assailed the monks and nuns, and reduced the convents to ashes. Jerome barely escaped by flight.—The writings of St. Jerome comprise a "Dialogue against the

Luciferians;" a work against Helvidius "On the Perpetual Virginity of the Blessed Virgin Mary;" 2 books on virginity against Jovinian; an "Apology to Pammachius," and a reply to Vigilantius, both on the same subject; a controversy on Origenism, with his friend Rufinus, who had translated some of Origen's works; and 2 books against Pelagianism. The dispute on the doctrines of Origen led to a quarrel with Rufinus, but the two friends were afterward reconciled. St. Jerome owes his eminence among the fathers of the church chiefly to his Latin version of the Scriptures, which is the basis of the present Vulgate. (See BIBLE, vol. iii. p. 232.) "Nothing," says Alban Butler, "has rendered St. Jerome so famous as his critical labors on the Holy Scriptures. For this the church acknowledges him to have been raised by God through a special providence, and particularly assisted from above, and she styles him the greatest of all her doctors in expounding the divine oracles." The principal editions of St. Jerome's works are the *editio princeps* (fol., Rome, 1467), containing only a few minor treatises and letters; the *Tractatus et Epistolæ* (2 vols. fol., Rome, 1468); an edition by Erasmus (9 vols. fol., Basel, 1516), the first complete collection; that of the Benedictines (5 vols., Paris, 1693-1706); and the excellent edition of Valarsi (11 vols. fol., Verona, 1734-'42).

JEROME OF PRAGUE, a Bohemian religious reformer, born in Prague about 1378, burned at Constance, May 30, 1416. His family name was Faulfisch. After graduating at Prague he visited the universities of Cologne, Heidelberg, Paris, and Oxford, at which last he is said to have imbibed liberal doctrines while copying the works of Wycliffe. Returning to Paris, he distinguished himself by preaching boldly in favor of reforms in the church, defending his views with great ability in a disputation held with Gerson, chancellor of the university. His extensive learning, and especially his acquaintance with scholastic logic, gained for him a high reputation, and vast audiences wherever he lectured. He was employed by Ladislas II. of Poland to organize the university of Cracow, and received marks of honor and respect from several monarchs. About 1402 Jerome began to secretly disseminate the doctrines of Wycliffe in Bohemia, and in 1408 he openly identified his views with those of Huss. In the political and religious tumult which followed the first debates and interdicts of this time, Jerome distinguished himself by bold and sometimes rash attacks on the church, which soon involved him in difficulties. At Vienna he was imprisoned, and only released through the earnest entreaty of his Bohemian friends. When Huss was imprisoned in Constance in 1415, Jerome went thither in accordance with a previous promise to defend him before the council. On arriving he was alarmed at the rumor that Huss would only be tried to be executed, and he accordingly fled to Überlingen, whence he intimated his willingness to appear before the council if a safe-

conduct were furnished him. An equivocal answer being given, he prepared to return to Prague, but was arrested by order of the prince of Sulzbach, and delivered over by him to the council, May 23, 1415. He was several times brought to trial, but his learning and well practised power of debate enabled him to answer all arguments urged against him. But on his third examination, Sept. 11, 1415, he made a qualified recantation of his views as to the sacrament. After being imprisoned for several months, he was again brought before the council, May 26, 1416, and solemnly retracted his late admission of error. This hastened his condemnation, and on May 30 he was burned at the stake, meeting his fate with courage. His life has been written by Heller (Tübingen, 1835), and by Becker (Nördlingen, 1858).

JERROLD, DOUGLAS WILLIAM, an English author, born in London, Jan. 3, 1803, died there, June 8, 1857. His father was manager of a theatre in Sheerness, Kent, but Jerrold himself manifested from boyhood a dislike for the stage, and being attracted to the sea, obtained in 1813 a commission as midshipman. The hard life in the service, and the position of "something between a gentleman and a footboy," did not suit him; and when paid off, Oct. 21, 1815, he did not attempt to reënter the navy. His father had been ruined as manager, and the family went to London, where in 1816 the boy was apprenticed to a printer, and devoted his leisure to study and reading. His first literary effort was a comedy, "More Frightened than Hurt," written when only 15 years old; it was sent to a London theatre, where it remained unread for two years, but met with great success when brought out at Sadler's Wells in 1821. During this time he published some lyrics in "Arliss's Magazine," became intimate with Laman Blanchard, his fellow workman, and appears to have steadily qualified himself for the duties of journalism. Having had an order to see the new opera of *Der Freischütz*, Jerrold, much excited by its wild, romantic spirit, passed the night in writing a criticism on it, and in the morning dropped it into the editor's box of the newspaper ("The Monitor") for which he worked as printer. It attracted much attention, and when Jerrold announced himself as its author he was at once engaged as a writer for the paper. The success of his comedy procured him orders for much dramatic work, and the year 1825 found him married and writing for a weekly salary farces, show pieces, and squibs of every kind for the Coburg theatre. In 1829, having quarrelled with the manager of this establishment, on account of a play, "Black-Eyed Susan," just written, as usual to order, Jerrold left his situation, and went with the MS. to Mr. Elliston at the Surrey theatre. It had a run of over 300 nights, and brought in many thousands for the manager, though the author only received about £70. The reputation which he acquired was, however, a partial equivalent for the money which he should have had. In 1830 the success

of a new play, "The Devil's Ducat," at the Adelphi theatre, introduced him to Drury Lane, where he produced "The Bride of Ludgate" and "The Rent Day;" the latter, founded upon two pictures by Wilkie, was also strikingly successful. At this time Jerrold began to number among his intimates many eminent writers, one of whom was William Godwin. From 1831 to 1836 he wrote "Nell Gwynne," "The House-keeper," "The Wedding Gown," and "Beau Nash," all of which were successful. In 1836 he undertook the management of the Strand theatre, with his brother-in-law, but ultimately failed in the speculation, and returned to literary pursuits. He had already produced many striking pieces in different magazines, "stories chiefly with the silken thread of philosophy woven through them." Those contributed to "Blackwood" and the "New Monthly" were republished in a volume under the title of "Men of Character." Jerrold was in Paris when "Punch" was started, in 1841, but on returning he became one of its most popular contributors. His "Q." papers, "Story of a Feather," and the "Candle Lectures," made his name widely known. In 1843 he started the "Illuminated Magazine," discontinued after two years, and followed by his "Shilling Magazine," which was also a failure. More successful was his connection with "Lloyd's Weekly Newspaper," which at the time of his death had reached a circulation of 182,000 copies. Few men of letters were more celebrated than Jerrold for witty conversation or satirical retort, and the innumerable anecdotes of his personal peculiarities and conversation caused him to be better known to the public as an individual than almost any other contemporary writer. Notwithstanding the severity and harshness of much of his repartee, he is said by those who knew him best to have been a sensitive man, of kind feelings, fond of children, and devoted to his friends to such a degree that his most serious troubles arose from this source.—See the "Life and Remains of Douglas Jerrold," and "Douglas Jerrold's Wit and Humor," both by his son, William Blanchard Jerrold (London, 1858).

JERSEY, a W. co. of Ill., bounded W. by Illinois river, and separated from Mo. on the S. by the Mississippi; area, 352 sq. m.; pop. in 1855, 8,771. The surface is diversified with prairies and woodlands, and the soil is generally fertile. The productions in 1850 were 759,530 bushels of Indian corn, 154,127 of wheat, 96,753 of oats, and 11,631 lbs. of wool. There were 13 grist mills, 6 saw mills, 1 newspaper office, 10 churches, and 963 pupils attending public schools. The St. Louis, Alton, and Chicago railroad passes through Jerseyville, the capital.

JERSEY, the largest and most important of the Channel islands, lying in the English channel, and belonging to Great Britain. It is about 12 m. long from E. to W., and 7 m. wide, and contains an area of about 40,000 acres; pop. in 1851, 57,155. The coast is indented with numerous excellent harbors, and save toward the

S. is in general bold and precipitous. The surface is an alternation of wooded hills and fertile valleys. The highlands in the N. consist chiefly of granite, and the reddish white sienitic granite which forms the cliffs on the N. coast is quarried extensively for exportation. In the S. schist is found overlying the granite formation. The island contains neither limestone, chalk, marl, nor gravel. The climate is mild and healthful. Agriculture is still in a very defective state, in consequence of the minute subdivision of the soil, and the want of capital. The only manure used is *vrac*, a species of sea weed, which is gathered at certain seasons, and applied to the soil either in its natural state or after being burned. An excellent breed of cows, small sturdy horses, sheep chiefly of the South-down stock, and a few varieties of feathered game are the most important animal productions. Nearly all forest trees common to this latitude are found to thrive; wheat, potatoes, parsnips, and lucern are cultivated, and much attention is devoted to apple orchards, for which the soil and climate are particularly favorable; as many as 30,000 hlds. of cider have been made in good years. One of the most remarkable products of Jersey is its Chaumontelle pears, a single one of which frequently weighs a pound. The most important manufactures are shoes and hosiery; ships are also built. The chief exports are cattle, potatoes, and oysters, great quantities of which are taken off the coast; the principal imports are woollens, hardware, soap, glass, earthenware, and coal. The oyster trade employs about 3,000 persons and 400 or 500 vessels. The principal beds are on the E. side of the island, the best being nearer to the French coast than to Jersey. By the terms of a convention between Great Britain and France in Aug. 1839, the oyster fisheries are to be free to boats of both nations except within 3 m. of shore. Between the months of February and May about £5,000 worth of oysters are sent from the Jersey beds to Eugland, where most of them are deposited in "parks" along the coast of Essex and the Thames, to be withdrawn according to the demand of the London market. The harbor of Gorey on the E. shore of the island is the principal rendezvous for the vessels.—Jersey has a legislature of its own, called the "states," or insular parliament. It consists of the governor and the baily of the royal court, who are appointed by the crown; the 12 judges of the royal court, who are chosen for life by the rate payers; the rectors of parishes, who are appointed to their livings by the governor; and 12 constables (one from each parish), elected for 3 years by the inhabitants. The *vicomte*, or high sheriff, and the two *dénonciateurs*, or under sheriffs, occupy seats as officers of the assembly. The crown officers may take part in the debates, but not vote. The governor in special cases may confirm or annul the decrees of the states. The royal court is the supreme tribunal in civil and criminal cases; appeal lies from it to the sovereign in council. The language of the up-

per classes is generally French, but the masses still speak a dialect of the old Norman and preserve a number of Norman feudal customs. Capital, St. Hélier.

JERSEY CITY, a city of Hudson co., N. J., situated on the W. bank of the Hudson, at its entrance into New York bay, opposite the city of New York, from which it is about one mile distant; pop. in 1850, 11,437; in 1854, 20,989; in 1860, about 30,000. Although the peninsula upon which it stands was granted by letters patent from Sir William Kieft, director-general of the Dutch West India company, in the year 1638, it was used for farming purposes solely for more than 150 years, and it was not until the beginning of the present century that it began to be settled. In 1802 the whole population of the place, then called Paulus Hook, consisted of 13 persons, occupying but one house and out buildings. Like Brooklyn and Williamsburg, it is an outgrowth of New York. In 1804 the "associates of the Jersey company" were chartered by the legislature of New Jersey, and laid out the whole of Paulus Hook into blocks and streets. In 1820 "the city of Jersey" was incorporated with a board of selectmen; in 1838 it was reincorporated as "Jersey City," with a mayor (who is elected annually) and common council. The city is well laid out, with broad right-angled streets and spacious public grounds. Many of the private residences in Washington, Essex, and other streets are equal to any in Fifth avenue, New York. It is lighted with gas, and supplied with pure water, which is pumped up from the Passaic river at Belleville, 4 miles above Newark, and conducted in pipes all over the city. The corporate limits of the city include an area of about 1,000 acres, with a water front of 8,000 feet. There are no striking public buildings save the spacious railroad depot recently erected. This is one of the most important railway stations in the United States, 106 freight and passenger trains arriving and departing daily. In and about this edifice are the termini of the New Jersey railroad and transportation line, connecting New York and Philadelphia; the Morris and Essex railroad, connecting New York with Hackettstown; the New York and

Erie railroad; the northern railroad, connecting Jersey City with Piermont; and the New Jersey central railroad, connecting New York with Easton, Penn. Jersey City is connected with New York by a ferry, the boats of which are very large, commodious, and lighted with gas. They ply between the two cities every few minutes throughout the day and night. The city is divided into 4 wards, each of which sends 4 aldermen to the common council, who are elected every two years. The principal business is manufacturing. The crucibles made here are used in the mints of Europe as well as of this country. The other manufactures consist chiefly of flint glass, pottery, soap, starch, cement, locomotives, machinery, cast steel, iron ware, and fireworks. Although not a port of entry, being included in the New York custom house district, it is one of the depots of the Cunard steamship line between the United States and Great Britain, as well as the starting point of the smaller steamships of this company, which ply between New York, Halifax, and the West India islands. It has a considerable fleet of schooners engaged in bay fishing, oystering, and the southern coasting trade. As the terminus of the Morris canal, it is also an extensive coal mart, as well as the depot of the pig iron made along the banks of the canal. The coal receipts in 1858 were 356,297 tons, and in 1859, 350,331 tons. It contains two banks of discount and a savings bank, and supports two daily newspapers. There are about 20 churches of the various denominations, and a good high school and common schools, under the control of a board of education. In the winter of 1836-'7 the awful shipwrecks of the Bristol and Mexico on the Long island coast, in which so many lives were lost in consequence of the inefficiency of the New York pilots, caused congress to pass a law creating a rival pilot establishment, called the New Jersey pilot association, which has its head-quarters at Jersey City. The two pilot associations now rival each other in devotion to their profession, and complaints of negligence from shipmasters are very rare. The present force of the New Jersey association consists of 4 boats and 26 pilots.



